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# MILITARY REVIEW

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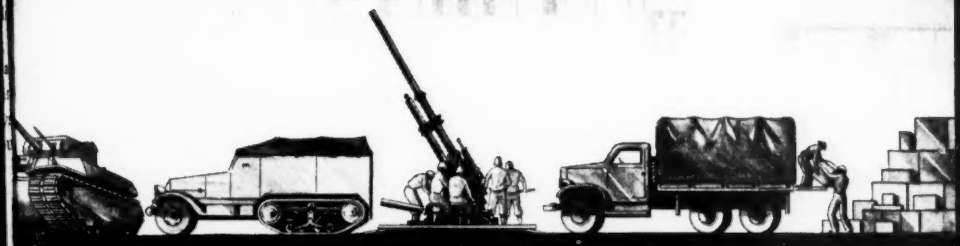

COMMAND AND GENERAL STAFF SCHOOL

FORT LEAVENWORTH, KANSAS

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A MONTHLY REVIEW OF MILITARY LITERATURE

XUM

VOLUME XXIV JULY 1944 NUMBER 4

COMMAND AND GENERAL STAFF SCHOOL

# MILITARY REVIEW

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# Isolation of the Battlefield by Air Power

GENERAL HENRY H. ARNOLD

COMBAT aviation when employed by the higher commander, trained in the correct use of Air Power, is a powerful means for influencing the course of battle. The formulation of a correct Decision which results in the proper employment of the Air Power assigned to the Theater is a function of command, and this Decision can be properly concluded only after a thorough and exhaustive Air Estimate of the Situation by the Air Commander and his Staff. A faulty or incomplete air Estimate of the Situation can result only in an equally faulty and incorrect Decision and a subsequent employment of the available Air Power against unremunerative targets. Through such employment, the great offensive potential of Air Power is nullified and its contribution to eventual victory greatly weakened or perhaps completely lost.

The Nazis have furnished us an excellent example of incorrectly employed Air Power. In 1939, when the Nazis had the greatest air bombardment fleet in the world, it turned its efforts against the civilians of London. Targets of great strategic value such as factories, transportation facilities, and ship producing facilities were neglected in a vain attempt to make the British people cry "Quits." That Hitler and Goering failed is a matter of history. That we are not making the same mistake today is now a subject of great concern for Hitler and the entire German people.

Under certain tactical conditions and from a correct Air Estimate of the Situation, the Commander will often decide that the enemy's rear areas offer the most favorable opportunities for the employment of the major part of the Air Power at his command.

Normally, employment of the greater part of the aerial offensive effort against the enemy's rear areas is that aerial phase of operations referred to as the "Isolation of the Battlefield."

Field Manual 100-20, Command and Employment of Air Power, outlines my doctrine as to the proper employment of tactical air strength. It states: "The mission of the tactical air force consists of three phases of operations in the following order of priority:

(1) First priority—To gain the necessary degree of air superiority. This will be accomplished by attacks against aircraft in the air and on the ground, and against those enemy installations which he requires for the application of air power.

(2) Second priority—To prevent the movement of hostile troops and supplies into the theater of operations or within the theater.

(3) Third priority—To participate in a combined effort of the air and ground forces, in the battle area, to gain objectives on the immediate front of the ground forces."

There can be no "D" day or "H" hour at which one phase of activity is completed and another phase begun. All three phases of the aerial offense will in most probability be conducted simultaneously, but, and this is the important fact to note, the first phase will always have the higher priority even though the greater number of aircraft and personnel may not be involved in its accomplishment. The second and third phases will be assigned to the aircraft and personnel not needed for the successful accomplishment of the first phase of the aerial operations. It has often been found necessary, because of the enemy's effort to reinforce his air defensive strength, to assign the mission of regaining the necessary degree of air superiority to the greater part of our Air Power even after that necessary degree of air superiority had been once established and emphasis had been placed on missions aimed at the accomplishment of the "Isolation of the Battlefield."

Thus, isolation of the battlefield may be and will most likely be begun even though the necessary degree of air superiority in the battle area has not been accomplished, but its attainment must be attempted only by the aircraft not needed to attain or maintain the necessary degree of air superiority. Even though the aerial offensive operations have developed to the extent that isolation of the

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battlefield is requiring the combined efforts of the greater number of the Air Force personnel and the greater amount of the Air Force equipment, it must not be supposed that continued efforts to maintain the required degree of air superiority can be neglected and that counter-action against enemy aircraft and the sources of strength of his air power is no longer necessary. It is thus established that as the battle, or campaign, proceeds to a successful conclusion, more emphasis passes to the second and third phases of operations but the priority remains the same.

The attainment of the necessary degree of air superiority is a prerequisite to successful accomplishment of the second and third phases.

Let us assume that our air strength has established the necessary degree of air superiority. Under this condition, the ground and naval forces can operate in the Theater with a much greater degree of mobility and more effort can be directed toward the accomplishment of their offensive mission since a lesser effort is needed to counter the capabilities of the enemy's weakened aerial strength.

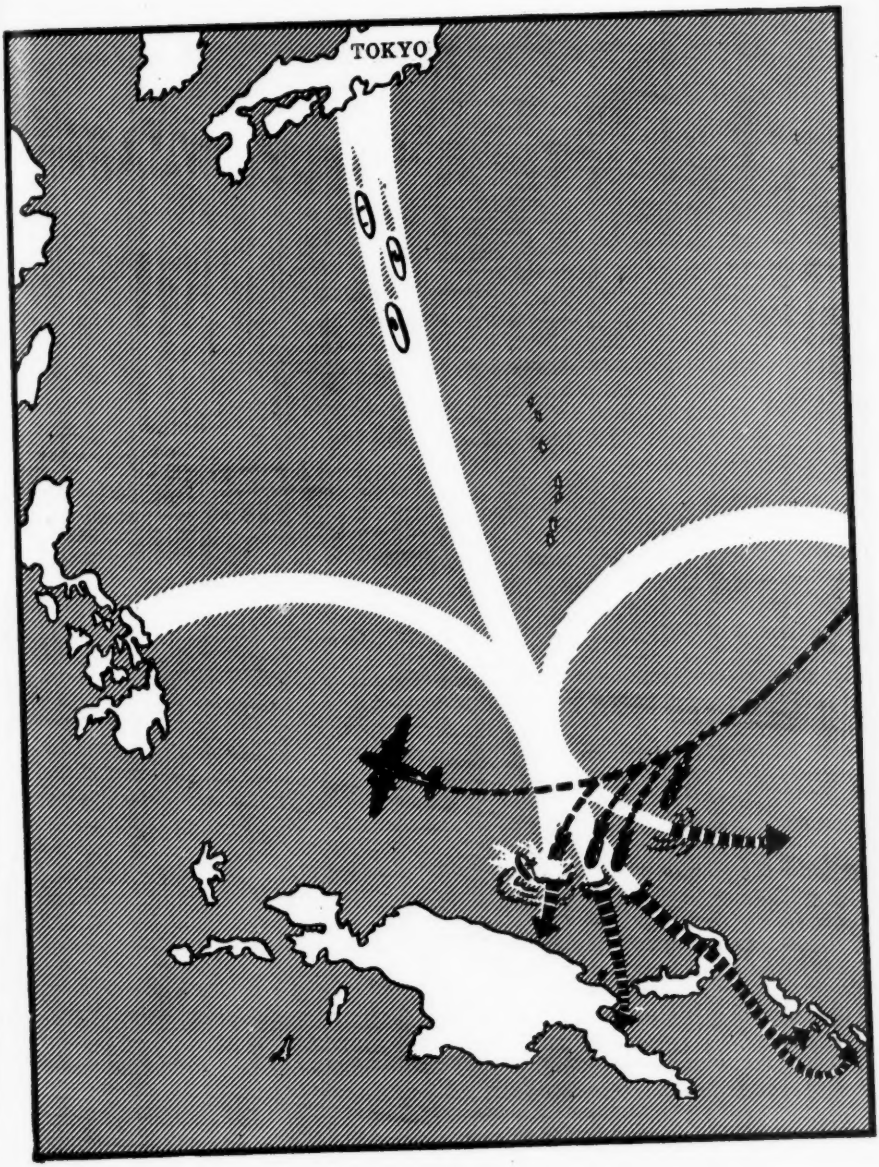
This decisive advantage of air superiority having been attained, greater aerial offensive effort is now directed toward the successful accomplishment of the second phase, namely, that of isolating the battlefield. The purpose of this offensive effort is to prevent the movement of hostile troops and supplies into or within the theater of operations. If the enemy is not permitted because of the efficiency of our aerial blockade to reinforce the areas under attack by our combined arms, it follows that the consistent but ever increasing rate of attrition resulting from the combined power of all of our arms must finally result in a decreasing of his ability to resist. Complete collapse is the ultimate result.

Modern mechanical war with its ever greater demand for technical supplies and services requires a constant flow of supplies. The enemy's Line of Communications is the lifeline of his ability to resist and to fail to protect this lifeline is to invite disaster. Failure to receive these supplies presages defeat if facing an enemy that has successfully secured and maintained his own Line of Communications.

Not only is the enemy prevented from moving into the theater the weapons and personnel of war needed to increase his resistance, but he is also unable to replace the constant attrition of men and material suffered in opposing our forward movement.

Proper targets in this phase of operations are many. Any aerial operation that will prevent or delay the arrival of personnel or any type of military supplies in the Theater of Operations is aiding in the isolation of the battlefield. In an area where the main lines of communications are the sea lanes, this means a constant and continuous aerial effort against enemy shipping and harbor facilities. Not only will the destruction of his cargo vessels, his troop transports, and his tankers satisfy the requirement, but the damaging and destruction of the warships used as escorts is a direct contribution because the enemy's ability to protect his Line of Communications in the future is materially weakened by such losses. This compels the enemy, if the attrition of escort vessels has been sufficiently great, to desist in his efforts at reinforcement and resupply or to attempt to continue his efforts with less well protected convoys. If he discontinues his efforts to reinforce and supply his forward bases, then these bases must certainly fall before our ground offensive. If he continues his efforts, then our aerial offensive directed at the more weakly protected Line of Communications encounters even less opposition and the results obtained are greater.

In 1943, the forces of the Southwest Pacific faced a tremendous job in forcing the enemy from his numerous bases on the North Coast of New Guinea. Six months had been required to take Buna. At the speed that we were moving on the ground, it would have taken years to have freed even New Guinea. Then the Fifth Air Force, strengthened by planes, men, and newly constructed air bases, began its offensive against the Japanese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military strength and its Lines of Communications. Gradually his Air Power was driven back and then his Lines of Communications were attacked. In the Battle of the Bismarck Sea the Fifth Air Force destroyed a total of twenty-two warships, troop transports and supply ships. In this single operation, one Jap division and all its equipment was destroyed at the cost to the AAF of twelve men and six aircraft. Because of our continued superiority in the air, the enemy was unable to supply his forward area and it collapsed under our integrated military effort.

Today our forces are in Hollandia because the enemy's air power was destroyed, his forces immobilized, and his supply lines cut by the concentrated use of our air strength against proper targets.

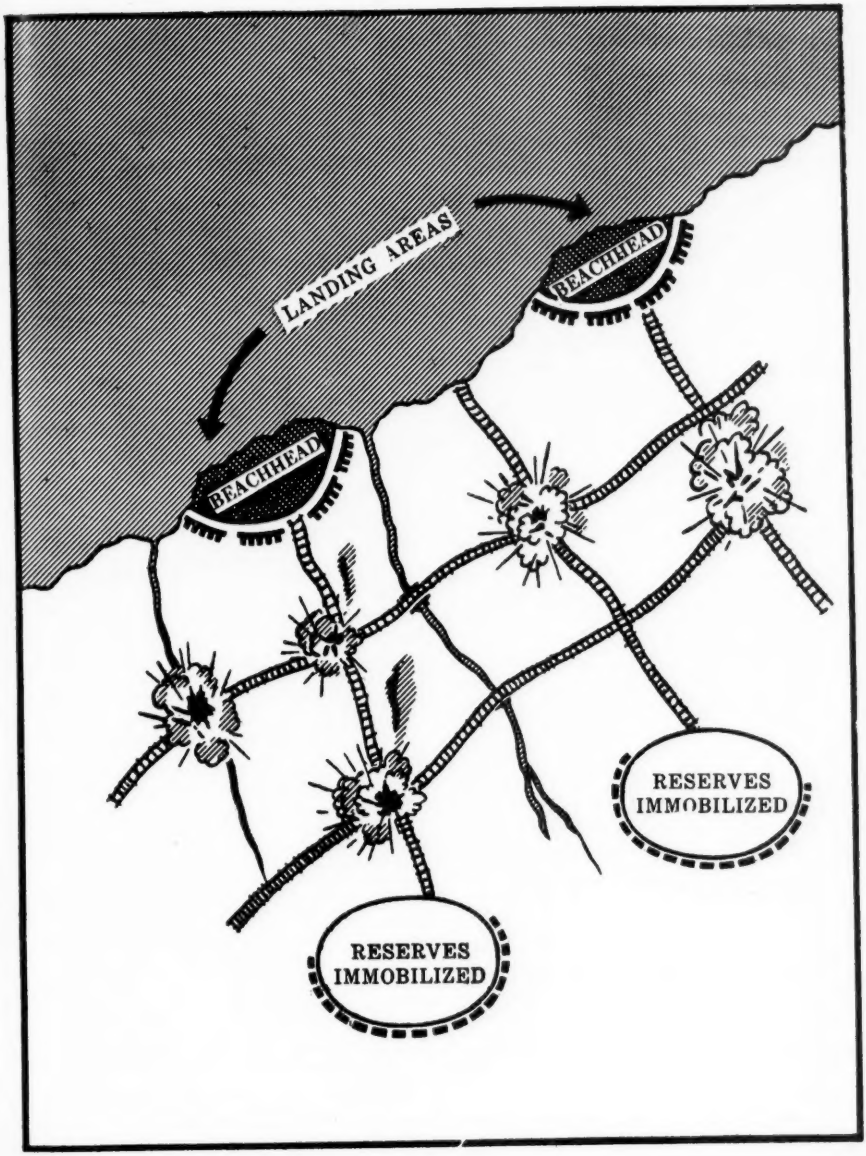
In a Theater of Operations where the enemy depends upon a network of railroads, rivers, and highways for supply the targets are numerous. Not only is the actual conveyor of the personnel or supplies a target but the route he covers is a logical and proper target. Destruction of the vital and key points of the transportation system such as highway and railroad bridges and railroad centers causes delays out of proportion to the actual material damage inflicted. Rerouting of highway and railway vehicles interferes with movements already scheduled on alternate routes. Again, as on the oceans, the results are accumulative. As more roads and railroad lines are blocked, increasing congestion on the remaining system of highways and railroads is the inevitable result. This congestion of traffic presents our Air Power with more lucrative targets and renders the remaining routes even more vital to the enemy. It is to be noted that in aerial action against enemy ground Lines of Communications, the effect felt is only temporary unless —and this is vital—constant aerial pressure is maintained thereby keeping the highways and railway systems blocked and continuing the congestion on the remaining part of the transportation system until those lines are also blocked or until the part of the transportation system remaining to the enemy is absolutely incapable of logistically supporting the degree of operations necessary to hold our forces in check.

Today over northern Europe, our Eighth and Ninth Air Forces are disrupting and destroying the transportation system that Hitler needs to meet the Invasion of the Continent. It is one of the missions of these Air Forces to damage or destroy the road and railroad system so that the German High Command will not be able to promptly move the necessary reserves into the areas threatened by our invasion forces. To immobilize the German Reserve is to assure that our ground and air forces have superiority at the desired points.

The operations described above are limited to the effort of preventing the arrival in the Theater of the men and implements of war. It has often been advantageous to prevent the movement of equipment and reserves within the Theater of Operations. If because of our aerial offensive in his rear areas, the enemy is denied the opportunity to move reserves to meet points threatened by our forces, then we are able to establish overwhelming air, ground, and naval superiority in any area or part of the Theater that we may desire. This loss of mobility by the enemy, even though our strategy and tactics may become obvious, enables us to hit him when he is unable to deploy his forces to meet our concentrations of strength.

Even if our air strength is unable to prevent the arrival of some supplies into the enemy's forward areas, constant air activity behind his front lines can destroy or so damage these supplies that their value to the enemy, even after all his efforts to bring them to the Theater, is destroyed. An example of this today is the large store of supplies once located on Wotje, Mille, Maloelap, and Jaluit, the principal atolls of the Marshalls still in Japanese hands. Constant air activity expended on these atolls is steadily destroying the large stores of supplies he has accumulated there and is rendering doubtful his ability to even exist.

When overall strategy demands the taking of these atolls the enemy's ability to re-


LANDING AREAS
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sist will have been greatly reduced or will have become nonexistent by the losses in matériel and men that have resulted from a daily pounding of these isolated land areas by the aircraft of the Seventh Air Force.

The isolation of the battlefield or the battle area by the Army Air Forces demands the expenditure of a vast amount of effort and time by our Air Force personnel and the expenditure of large quantities of matériel. To make this expenditure of so much effort, time, and matériel acceptable, it must pay exceedingly rich dividends. These dividends are the logical result of a correct Decision employing an Air Force of adequate size, which is superbly equipped and carefully trained, to convert the correct Decision into an accomplished fact. The immediate result is an enemy military force weakened by the daily attrition of war, incapable of being reinforced and resupplied from the Homeland, and unable to move reserves within the Theater to points under attack or threatened by attack. The final result is a rapid deterioration of the enemy military situation and ultimately the complete collapse of his resistance.

In the past, the Army Air Forces have logistically isolated large enemy forces and have thus directly contributed to the annihilation and destruction of the enemy force as an effective fighting machine.

In the future, the Army Air Forces shall continue to contribute to ultimate victory by the continued accomplishment of all of its missions, of which "Isolation of the Battlefield" is only one.

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## Medical Department Maintenance Program

Prepared for the MILITARY REVIEW under the direction of the Director, Maintenance Division, Army Service Forces.

UNTIL about a year ago, the Army's Medical Department had little to do with maintenance of its equipment. Today, in accordance with suggestions of the Maintenance Division of the Army Service Forces, a full-fledged maintenance program is in operation under the Medical Department's own Maintenance Division.

Number one feature of the program is the maintenance section of the St. Louis Depot. Before the war, anything higher than first and second echelon repairs had to be performed by the manufacturer of the equipment, because of the delicacy of assemblies and highly specialized procedures involved in its operation and maintenance. Now, the St. Louis Depot constitutes a fifth echelon shop which has taken over most of the normal maintenance requirements of the Medical Department. It is estimated that at the present time only about ten percent of the equipment needing repair goes back to the manufacturers. One of the Depot's auxiliary functions is the conducting of a school, where men are trained for particular maintenance jobs.

Other features of the general program include the following:

*1.* Each of the six medical distribution depots which act as clearing points for equipment coming in to St. Louis for repair, has assigned to it a Medical Equipment Liaison Officer. These officers make regular inspection trips and special detail trips to medical installations, and they are equipped to make many repairs on the spot.

*2.* Portable optical repair units operating in the field, now make it possible in many instances for men to get new pairs of glasses in a matter of hours instead of days.

*3.* Spare parts lists and technical manuals on maintenance are making their contributions to more efficient service.

# Importance and Development of Leadership in Our Small Unit Commanders

COLONEL A. R. MACKECHNIE, *Infantry*

*Colonel MacKechnie has recently returned from the Southwest Pacific Area. In New Guinea he commanded the 162d Infantry which was engaged in active operations against the Japanese.—THE EDITOR.*

IN NO profession is the quality of Leadership more essential than in the military service. Upon it depends not only men's lives but the success or failure of battles. Leadership is developed in our day to day life with the ultimate objective of its application in combat. It is then that its presence or absence becomes apparent, for it is then that all men are reduced to that common ground—the conflict between duty and self-preservation. When bullets are whining, bombs falling, or shells bursting, rank or station mean little and a man's life becomes his most cherished possession. It is then that men gravitate toward their leader, be he field officer, lieutenant, or non-commissioned officer. Fortunate is he, who, during the stress and strain of battle, is able to hold the confidence of his men, to think logically, to make sensible decisions, and to carry them into effect promptly and decisively.

In jungle warfare Leadership on the part of junior officers and non-commissioned officers is probably of greater importance than any other single factor. Much of jungle combat consists of small unit operations of the platoon, squad, or smaller groups. Visibility is limited and communication problems are multiplied. Everything used in battle must be carried by hand or on the back. Travel is on foot, extremely slow, along rough trails through dense swamps or along narrow ridges. The difficulties of terrain, movement, supply, and communication are compounded by the rain, mud, humidity, and disease.

It is not unusual for a platoon, squad, or three or four men patrols to be completely separated from their companies for days at a time. In such circumstances, with the ever present menace of the Jap, the small unit commander becomes the most important leader in the Army, for upon his foresight in making preparations, his planning his judicious selection of routes and formations, his attention to detail, and, above all, his decisions made in emergencies, depends the success of his mission and the lives of his men.

Therefore, during all training preparatory to jungle combat the primary concern of higher commanders should be the development of Leadership among the junior officers and non-commissioned officers. Drills, exercises, and combat problems should be developed and scheduled with this objective in mind and opportunities afforded these leaders to actually exercise independent command of their units under as many different situations as possible. The qualities of Leadership can be developed only through constant training and practice. Mechanical drills and formations of larger units, training in the use of combined arms, supply, and communications are important, but the training of the small unit commander is vital.

A good leader trains his unit in advance and places responsibility squarely on the shoulders of his subordinate leaders. He evolves as many SOP's as possible during this training and thereby develops simplicity in operations and pride and self reliance among his subordinates. I once visited a company which had entered its bivouac area about an hour before. I found the company commander in his CP, with his First Sergeant supervising its set-up, the digging of foxholes, the stringing of vines along routes to key points within the perimeter. The company commander stated that he had not inspected the perimeter defense but had simply indicated the platoon sectors to platoon leaders, the CP location, the recognition signal, and the weapons platoon dispositions. We visited each platoon in turn and found substantially the same

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procedure had been followed there. Platoon leaders had indicated squad areas and the security system to be followed. Squad leaders had posted listening posts, selected locations for foxholes, and assigned specific men to the placing of booby traps, clearing light brush, and digging the holes. Platoon sergeants had distributed extra hand grenades and coordinated the squad sectors with each other and the LMG's. There was no confusion, loud talk, unnecessary movement, nor interference from higher leaders. Every man had his job and took pride in doing it exactly as he knew it should be done. This whole episode was not an accident but resulted from simple planning and careful training by the company commander *before* entry into the combat zone. Later in combat this company and its individual platoons distinguished themselves on numerous occasions because every leader had been trained as a leader and had the respect and confidence of all the men under them.

On another occasion I visited a different company. Again I found the company commander in his CP, but no foxholes were being dug. Only two sentries had been posted, one of whom was lying down reading a magazine. There was no definite relationship between the location of squads or platoons. No booby traps had been strung outside the company area. In still another company a machine gun had been set up for beach defense but no sector of fire nor FPL had been assigned and the dial was badly canted. At the mess no provisions had been made for sterilizing mess kits. Contrast the latter two examples with the one preceding them.

One day a four-man patrol under a sergeant was sent out to contact another unit about 500 yards away but separated from the first by an unknown number of Japs. No word was received from this patrol till four days later when the sergeant brought his patrol into the CP of the unit he had been sent to contact. He and his men were footsore, tired, and hungry, not having had a bite to eat for three days, but were proud in the knowledge of a job well done. He had led his patrol along the densely wooded mountain slope, through deep ravines, hiding at night and moving cautiously in daylight. They had encountered six organized Jap positions along the main mountain ridge, and finally he had led his patrol across the ridge between two enemy positions. Never once did he consider abandoning his mission and returning to his own unit. He was able to report the location of the Jap positions, and plans were under way to move a unit into a weak spot between two positions, but the Japs withdrew before they could be executed.

Another four-man patrol, led by a sergeant, reconnoitered the area in rear of a very strongly entrenched and fortified position on a mountain top. His patrol was gone two days, and he was able to report the location of the enemy flank and the depth of the position. Most important of all, he reported that a ridge almost in rear of the main Jap position, and flanking his route of approach and supply, was unoccupied. The latter information enabled one of our units to occupy the ridge and forced the Jap to abandon his entire fortified position on the mountain, suffering heavy losses from machine-gun and artillery fire during his withdrawal. The success of both of the above patrols was due primarily to the initiative, intelligence, and determination of their leaders.

A lieutenant with his platoon of thirty men was sent to follow a Jap raiding party of approximately 100 men which had crossed our trail in rear of us at night and apparently was headed for our artillery positions. For five days this platoon followed the Japs. Wire ran out, radios would not operate, and rations were gone at the end of the third day. It finally encountered the entire Jap party, laid an ambush, killed twenty-two, and dispersed the remainder. The lieutenant led his platoon out with only one man having been slightly wounded.

Another platoon had been sent from a different regiment to intercept the same Jap raiding party. After marching about six hours this platoon came to an inviting beach on the lake. The platoon was tired, hot, and had seen no signs of Japs; so all went swimming except for a few men on the beach. The

Japs surprised the platoon, killed eight, wounded several others, and dispersed the remainder, naked, barefooted, and without arms. The contrast in the Leadership of these two platoon leaders needs no comment.

On another occasion we had captured a strong position on a ridge and the Japs had withdrawn. When I visited it shortly after, I found no outpost to the front or rear although there were Japs still on the ridge above and below us. Men were lying down or walking about on the bare ridge line. Rations, grenades, and extra weapons were lying about in the mud. No effort was being made to keep the men under cover, to reorganize, to collect extra equipment, to outpost the position, nor to prepare for counterattack. The young lieutenant in command explained that the men were too tired. As a matter of fact *he* was the one who was tired.

On the same day, I ordered a battalion commander to move his reserve company up onto the ridge to fill a large gap in our lines. When he said the company had been down off the mountain for only two days after three weeks of constant combat, I told him this was an emergency, that the Japs were withdrawing, and that speed was essential. Three hours later when I reached the bottom of the ridge, the company was just starting up. While in reserve the company and battalion commanders had failed to assemble the prescribed reserve of two days extra rations and extra ammunition. These had to be drawn *after* the order was received. The delay enabled the Japs to organize a strong position at the highest point on the ridge which required a long time to overcome.

The subject of Leadership is one upon which innumerable articles have been written by some of the greatest military minds of all armies. Hours have been devoted to lectures on the subject, and all agree that leadership in the small unit commander is the most desirable quality. It is the quality we search for always among our commissioned and noncommissioned officers. Upon it depends to a large extent the soldier's chances for promotion and often the winning or losing of a battle.

This nebulous quality of Leadership is a combination of character, personality, and self-control. It seems to be born in some, but is capable of development by many. We have seen the "born leader" among young boys and in our schools. Some have become leaders through force, some through tact and diplomacy, and others through study and intelligence.

Regardless of whether it comes naturally or is acquired through hard work and determination, it still remains the most important quality in the soldier's life, be he the leader or the led. Upon it depends the success or failure of a campaign, skirmish, or patrol.

It is difficult to name all the elements which go to make a leader in their order of importance. These elements are diffuse and sometimes difficult to define but must include the following: character, determination, willpower, and intelligence. These general headings will include other sub-heads such as self-confidence, cheerfulness in adversity, force, tact, a sense of fairness and justice, open-mindedness, self-respect, a sense of humor, courage, modesty, calmness under stress, clear thinking, loyalty, knowledge, initiative, and foresight. They are the antitheses of carelessness, mental or physical sluggishness, arbitrary or high-handed methods, fault finding, selfishness, vacillation, snap-judgment, moodiness, inattention to detail, unjust criticism, or excuse making.

A good appearance and a fine physique are usually desirable but are by no means essential in the true leader.

Every campaign is replete with good and bad instances of leadership, of the swashbuckler back in the garrison who fails when the pressure is on; of the modest, retiring individual who comes through in the pinch; of the supply officer who gets the "pellets and tucker" to the troops in spite of hell and high-water; of the communications officer who lays and maintains fabulous amounts of wire; of the mess sergeant who improvises ranges, bake ovens, and utensils out of gasoline drums and discarded tins; of the rifle captain who adjusts his own artillery fire

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while leading an assault; of the platoon leader who, when his platoon is cut off and surrounded by Japs at night, says confidently, "Well, boys, this is where we show those so-and-so's what Americans can do."

Unfortunately, at least for those affected, the instances of poor leadership are not so well known, sometimes because no one returns to tell of them, or they are not readily recognized. Some of the latter cases are those where a leader has failed to foresee and plan his actions which should follow a success but is content to rest on his laurels; where he fails to provide reserves of rations and ammunition for emergency use; where he permits a set-back to discourage him and allows his feeling to be transmitted to his men; where he fails to issue clear and definite instructions and then blames someone else; where, through a mistaken notion of not overworking his men, he fails to insist on adequate security and protection for them; or to have an alternate plan to accomplish his mission if the original plan goes wrong, which the best of plans usually do.

The young leader of today has an enormous burden to carry. He comes into the service fresh from school or civilian pursuits; he is required to learn weapons, tactics, and administration at the same time he commands a group of men who usually have no more training than he; he must live with them, look out for them, and lead them in battle. Truly his is a heavy load and the wonder is that so many do such a fine job.

But let us help him all we can to prepare himself. Let us place as much responsibility upon him during training as he can bear; let us give him more and more opportunities to lead, to exercise initiative, to think, to plan ahead, to actually command his unit and develop his own self-confidence and build up the confidence of his men in him. Let us plan our training programs, schedules, exercises, and schools with this in mind; for after all it is the small unit, the squad and platoon, which will win this war, not the higher commanders and their staffs, however brilliant and efficient they may be.

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## Division Traffic Control System

ONE of our divisions in Italy, hampered in its operations by the limited road net, evolved a system of traffic control which contributed materially toward the success of its operations. The division commander describes the system as follows:

"All traffic over our road net is supervised by a Traffic Control Group consisting of a G-3 representative and a G-4 representative, with their assistants, working together in the same tent. No movement of more than three vehicles can be made without clearance from them. For example, if a troop movement is to be made, either by motors or by marching, G-3 notifies his representative in the Traffic Control Group that he wants to move such an outfit from here to there at about such a time. The two officers in the Traffic Control Group then figure out how they can clear the road for the movement. They may suggest a slight change of time in order to coordinate the movement with essential supply movements.

"Then, through a system of fixed traffic control posts, they keep movements going on schedule. It's much like a railroad dispatching job. With such a limited road net as we have here it's essential. It requires fixed traffic control posts at every point where the road changes from two-way to one-way and at all other critical points. It requires telephone or radio connection between the Traffic Control Group and every one of these posts. But you have to have it or you have nothing but confusion.

"Of course you can't run this system with a 77-man MP platoon. We have had about 115 men or more, with all the motorcycles we could lay hands on for control during advances, when you can't run telephone lines out fast enough."

# Pre-Induction Training for the Army

BRIGADIER GENERAL WALTER L. WEIBLE, *General Staff Corps*
Director of Military Training, Army Service Forces

TWO years ago, the Commanding General of the Army Service Forces asked the schools of the nation to enter into partnership with the Army in the job of preparing American boys for military service. It seems appropriate to report at this time how the schools have responded to that request.

HIGH SCHOOL BOYS AT THE START OF AN OBSTACLE COURSE. THIS IS A PART OF THE PRE-INDUCTION EDUCATIONAL PROGRAM FOR THE ARMED FORCES. (PHOTO BY U.S.A. SIGNAL CORPS.)

The Army's needs were laid before the schools for the first time on August 28, 1942, at a conference of educators invited to Washington by the United States Office of Education. Lieutenant General Brehon Somervell, in addressing this audience, stated that the schools could ease the burden on the Army training system and enormously speed up the process of building an efficient fighting force by equipping young men, prior to their induction, with the knowledge, skills, and physical stamina essential to a modern Army.

Complete plans for the 1942-43 school year had already been made by the schools, and there was doubt as to whether pre-induction training could be worked into the schedules on such short notice. The record of what the school systems of the country accomplished during that year, in the face of such difficulties, speaks for itself.

Within a few months of the conference,

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the War Department prepared, in cooperation with the U. S. Office of Education, a series of bulletins describing the Army's needs in the chief technical and vocational areas, in physics, mathematics, physical education, and military clerical procedures.

A few months thereafter, more than fifty textbooks based on these bulletins were made available to schools by independent publishers.

Five months after the conference—on February 1, 1943—state departments of education estimated that there were:

In vocational schools, learning trades useful to the Army—250,000 boys.

In high schools, studying such subjects as electricity, machines, radio, shopwork automotive mechanics, International Morse code, pre-flight aeronautics, driver education, and Army clerical procedures—600,000 boys.

In all secondary schools, enrolled in physical education which had been intensified for pre-induction purposes, and which in many cases included hand-to-hand combat, swimming, obstacle courses, and marching —1,000,000 boys.

These are impressive totals. It may be illuminating to see what they mean in terms of an individual school.

Among the schools which have furnished the Military Training Division, Headquarters, Army Service Forces, with full information about their pre-induction programs is the Thomas Jefferson High School of Elizabeth, New Jersey. Elizabeth is a town of 135,000 people in the Greater New York industrial area, and Thomas Jefferson High School has an enrollment of about 1,200 boys.

When the Army's needs first became known to this high school early in September 1942, students had been registered, schedules made, teachers hired and assigned, supplies bought, and the school system geared to begin the academic year. To introduce new courses, to rearrange schedules, to find teachers and laboratory equipment for additional technical subjects seemed impossible. But the teachers and administrators went to work doing the "impossible."

One month later, early in October 1942, they were able to introduce a full program of pre-induction courses with almost every eligible boy registered. In that month a number of extraordinary things were accomplished.

To find time for all the new courses it was necessary to add two periods to the school day—one before, one after the regular schedule. The teachers said to the boys, "If you are willing to go to school longer to do this work, we are willing to teach longer to give it to you." The result startled many a parent in Elizabeth: their sons getting to school an hour earlier to do work they were not required to do.

The problem of obtaining teachers was considerable. One teacher was borrowed from the junior high school because he knew International Morse code. A lawyer volunteered an hour of his time each day to teach celestial navigation. Several teachers gave up Saturdays all year to take advanced work in aeronautics at some university, in order to become better teachers of that subject. One of them also gave up Sundays and holidays and went to a neighboring state to take flying lessons —civilian flying being prohibited in New Jersey. Some of the teachers volunteered to teach extra classes. When the head of the science department was called into service, the former head came out of retirement to take his place. By one means or another, a pre-induction training staff was built up.

Equipment was even harder to get than teachers. Radio and aeronautical materials were frozen by government order. The school bought what it could. Boys collected old radio sets in order to use the good parts. They begged parts of old airplanes from nearby airports. A Coast Guard reserve officer loaned them his marine compass when he was not using it. One of the students built a small wind tunnel to illustrate the theory of flight with model airplanes. Old equipment was used to construct a device which enabled sixteen boys to practice sending and receiving code at the same time. Contracts were signed with neighboring organizations so that pre-induction swimming classes might

be held in their pools. A park in front of the school was made available by the city, and an obstacle course was built on it.

As a result of these efforts, Thomas Jefferson was able to offer pre-induction courses in electricity, machines, shopwork, radio, automotive mechanics, pre-flight aeronautics, International Morse code, celestial navigation, driver education, and refresher mathematics.

A HIGH SCHOOL CLASS IN AERONAUTICS, PART OF THE PRE-INDUCTION PROGRAM. (PHOTO BY U.S.A. SIGNAL CORPS.)

The commercial course now includes twenty lessons on Army clerical forms. French and Spanish courses have been revised to give prospective inductees rapid conversational mastery of the languages and of military terms. Units on the nature of Army life and on the background of the war have been introduced into English and social science courses. Physics and mathematics courses utilize many illustrations from military situations. Every boy has a complete physical checkup and, unless the doctor advises against it, takes a stiff course in pre-induction physical conditioning.

In simplest terms, this means that three out of every four boys who come into the Army from this high school have had at least one technical course aimed specifically at preparing them to do Army jobs, and have had a preliminary orientation to Army life. Moreover, every boy who is physically fit for military service has hardened his muscles and built up his endurance by a program of physical training.

The first classes graduated from Thomas Jefferson with this training have now gone into service, and the school has made an effort to find out whether the students' pre-induction work was of any help to them. On the basis of a questionnaire, school officials report that:

71 percent of Thomas Jefferson graduates in the services informed the services about their pre-induction training.

46 percent were assigned to military jobs which clearly use the kind of pre-induction training they had.

86 percent say that pre-induction courses helped them to "take hold" of their service training more easily.

77 percent say that pre-induction courses helped them to "master" their service training more easily.

94 percent recommend pre-induction training for boys now in high school.

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There is no intention of suggesting that Thomas Jefferson High School is in every way typical of American high schools, or that its pre-induction program is a representative program. On the contrary, it may be one of the best. It illustrates the kind of contribution an intelligent and energetic school system can make to the preparation of a national Army.

All evidence indicates that pre-induction training is widespread and effective throughout the country. A survey of 400 California schools made by the State Department of Education in the first semester of the 1943-44 school year shows that 78 percent of those schools are offering a pre-induction course in shopwork, 50 percent in auto mechanics, 47½ percent in pre-flight aeronautics, 39 percent in electricity, 37 percent in radio, 34½ percent in machines, 7½ percent in aircraft mechanics, and 5½ percent in driver education. More than 60,000 students were enrolled in these courses in the 400 California schools surveyed. Another 11,000 were taking physics, 23,000 geometry, and more than 5,000 trigonometry.

Pre-induction training has expanded steadily throughout the nation. The State Department of Education in Illinois reports that, whereas during the 1942-43 school year there were 165 pre-induction classes in electricity, during the school year of 1943-44 there were 223. In the same period, the number of classes in machines increased from 97 to 146; in shopwork, from 127 to 152; in radio, from 80 to 108; in Army clerical procedures, from 19 to 47; in pre-flight aeronautics, from 248 to 307; and in refresher mathematics, from 260 to 438.

On the basis of reports from several states and of samplings made by educational organizations, it is possible to say conservatively that a million boys have now reported to induction stations with some kind of high school technical training aimed at making them more immediately useful to the Army. It may further be said that almost every boy who now leaves high school and enters the service has developed improved muscle tone and endurance as a result of courses in physical education much more rigorous and extensive than the schools have customarily offered.

This accomplishment reflects the most earnest and patriotic effort on the part of the school administrators and teachers of the nation to cooperate with the armed services.

Students who have had pre-induction training should come into the Army with knowledge and skill of military value. It is the Army's loss if the classification and assignment officers do not discover and make use of this knowledge and skill.

What has been the War Department's relation to and attitude toward the pre-induction training program in the schools?

The War Department, through the Pre-Induction Training Branch, Military Training Division, Army Service Forces, has stated the Army's pre-induction training needs to civilian schools. It has done this so that any school which is willing to prepare its students to meet some of these needs prior to their induction may do so with maximum efficiency. An effort has been made to state not only the technical needs of specific military jobs, but also the common needs of all soldiers—rugged health, skill in oral and written communication, competence in simple mathematics, knowledge of military map reading, orientation to the demands of military life, acquaintance with first aid and sanitary practices, and knowledge of why and how the war is being fought.

The War Department does not presume to tell the schools how to meet these needs or how to teach the required skills; that is an educational problem to be met by the schools and their representatives.

Whenever possible, however, the War Department has furnished information requested by cooperating schools, offices, and agencies. Full cooperation was given the U. S. Office of Education in the preparation of various bulletins for pre-induction training. Representatives of the War Department have sat in an advisory capacity on the national

policy committee of the High School Victory Corps. Pre-induction officers in the Service Commands have explained the nature of the Army's needs to state departments of education and to local schools. A multitude of questions and requests have come to the Pre-Induction Training Branch of the Military Training Division, ASF, in Washington, and, whenever possible and proper, they have been answered.

Mainly, however, the War Department has passed the ball to the schools. The fact that they have carried it so magnificently has put the obligation back on our shoulders—to make full use of the pre-induction training their graduates bring with them.

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## German Assault Divisions

Translated at the Command and General Staff School from a German article in *Hamburger Fremdenblatt* 11 February 1944.

OVER the far-flung fronts the fight is not waged at all times and in all places with equal intensity. It flares up with increased vigor first here, then there, in offensive or defensive action. Hence, in addition to the regular forces, the command has need of others for the purpose of feeding the fight or of damping the action. It needs units which are particularly capable and experienced in fighting, which are specially equipped and trained for thrusts or counterthrusts.

We were familiar with this sort of unit even at the time of the World War—special divisions whose numbers appeared time and again in the reports of the great offensive and defensive operations on the eastern, western, and southern fronts. Quite recently we again ran onto the word "assault divisions" in the reports of the operations on the front.

As a rule, such units were not originally created expressly as assault divisions. Rather, circumstances prepared them step by step for their task. At some time, they were located at a focal point of the fighting; they performed outstanding work there and attracted the attention of the higher command which, the next time there was a need for men, turned hopefully to them, pulled them out of their combat sector (which now had quieted down), and placed them at the point of danger. If they again came up to the expectations entertained with regard to them, they were probably accorded, as a reward, a longer or shorter period of rest, during which their ranks were again filled up, their weapons and equipment were replaced, and they were given an opportunity to develop the bonds of comradeship between young and old members of the unit, to broaden and deepen their tactical and technical knowledge, and to school their commanders, subordinate commanders, and specialists by means of appropriate courses of study. Perhaps they were equipped with new types of weapons which, before being made available to the troops, were to be tested by one unit of the forces, and which at first existed in small numbers only. Also, when they did not already belong to an armored or motorized formation, they were motorized to an increasing degree, in order to be more rapidly shifted. And so, before they themselves suspected it, they had grown into assault divisions.

Next, when they were employed for particularly hard tasks, they were, when possible, reinforced still further by combat units such as heavy artillery, mortars, antitank and antiaircraft guns, assault guns, and combat engineers. They were also provided with supply trains of their own for carrying their ammunition and motor fuel. When they had once won the name of "assault divisions" at the front and at home—regardless of whether they were units belonging to the army or to the *Schutzstaffel*—it was natural that volunteers, both men and officers, who were animated with the spirit of battle, should flock to them.

# The Strategical Situation in China

COLONEL CONRAD H. LANZA

CHINA north of the Yellow River, but excluding Mongolia, has an area of about 600,000 square miles, and an estimated population of 120,000,000. This land is rich, raises wheat and millet, and has much beef and mutton. This part of China has been in contact with the Japanese to a greater extent, and for a longer time, than the south. The people dislike the Japanese, but have learned to work with them when necessary.

China south of the Yellow River has an area of about 1,000,000 square miles, and a population estimated at 280,000,000. It is also rich country. Social habits and economic conditions differ greatly from north China. South China bitterly hates the Japanese.

Since the beginning of this century, China has come to hate the Japanese intensely and the Japanese reciprocate. The result has been a most savage and brutal war, which since 1936 has devastated China, more particularly that part south of the Yellow River.

North China has not suffered so much. Economic conditions are better there. The coming of the Japanese did not, to the same extent, destroy the slender balance of life common to the country. The inhabitants adjusted themselves to the new rule under less fighting.

Japan has not attempted to conquer all of China. She has occupied about three percent of its area. This, however, includes key cities, the ports, the railroad terminals, and a few important sections. Since 1939 Japan has not tried to enlarge her holdings. She doesn't have to. With the vital economic centers securely in her possession, Japan is in a position to strangle China economically, and is actively doing it.

Commerce flows normally over a few railroads, along the rivers and canals, and through the ports. The Japanese hold most of the important centers of communication. Unless it pass through Japanese-held emporiums, food can not be shipped to where it is needed, nor cotton from fields to mills, nor ore from mines to furnaces, nor many of the other materials which China could produce in abundance to where they can be processed.

At this date, the ninety-seven percent of China which is unoccupied and apparently free is either crumbling through lack of food and supplies or has had to submit humbly to Japanese-controlled rule.

When Japan attacked China, much machinery was moved from the coast areas deep into the interior. It was there set up and put to work. Years have passed. Now the machinery is worn. There is no way to get spare parts or new machinery, so prices are going up to astounding figures for the little that remains.

British and American planes fly some supplies, mostly war material, into China by the India to Chungking air route. Only a small quantity of commercial goods can be forwarded, much too little for what is needed for just elementary uses.

When the machinery was moved, forty million refugees went with it. To feed this mass of homeless in a country which never had any large excess of food supplies has been a difficult problem.

Strange as it may seem, Japan regularly sells supplies to unoccupied China. Japanese goods are for sale at Chungking. Naturally, none are useful for war purposes. They include food, cotton, and other necessities. The Japanese restrict quantities so as to assure continuing dependence upon themselves. In return, Japan receives tung oil, wolfram, and articles which are useful to her, and collects her commission on Chinese-produced articles which pass through Japanese-occupied centers en route from one province to another.

This commerce between China and her enemy is run by a species of black market, perfectly known to, and completely controlled by, the Japanese authorities. As the Chinese factories which were moved into the interior at the commencement of the war wear out or fail to manufacture due to lack of raw material, the Chinese economy becomes increasingly dependent upon Japan.

In some provinces starvation is present. Epidemics are rampant. Infant mortality is terrific. So far as fighting is concerned, it is nominal only.

Chinese troops, properly trained and fed, can fight well. The American-trained divisions in Burma have justified themselves. The underfed troops in China are more concerned with the problem of living than with the enemy who in most cases is distant. In the greater part of unoccupied China, due to lack of food, supplies, and transportation it is impossible to assemble an expedition large enough to threaten Japanese interests.

Inflation is mounting in unoccupied China. As the local factories close down, goods are scarcer. As compared with 1937, prices at the beginning of 1944 had increased two to five fold for ordinary articles, and the end is not in sight.

In occupied China, Japan is opening industrial establishments. Iron and steel plants are in production in the Peiping and Hankow areas. Japan fully expects her own industrial centers to be eventually bombed by the Americans. For two years she has been preparing for this probability by duplicating existing plants or by transferring plants from Japan to well scattered places in north China, Manchukuo, and Korea. These are centers of work and food for Chinese.

Japan has made no attempt to colonize China. The Chinese accept wages so low that the Japanese can not compete with them in an open market.

Three Chinese governments, all military and all of the dictatorial type, function in China.

The strongest, and the one controlling the larger part of unoccupied China, is that of the Kuomintang Party. The leader of that party is Chiang Kai-Shek, whose headquarters are at Chungking. In official publications, Chiang as Party Leader is listed ahead of his office of Generalissimo, or head of the State.

This Chinese government is recognized by the United Nations as the sole lawful one. The British and Americans furnish it with arms, munitions, supplies, and funds, to the extent permitted by available means. Russia for a time also furnished supplies. Criticism has sometimes appeared that China has not been receiving its fair proportion of Lease-Lend supplies. This may be so, but it is not due to lack of good will. Everything that can be sent is going forward. It is impossible to ship more under existing transportation.

The United States has also furnished the 14th Air Force, which is operating within China. It raids Japanese centers, assists struggling Chinese forces, and attacks enemy lines of communication. American training units are conducting schools for training Chinese troops.

According to Chinese accounts, the Kuomintang Army has 3,000,000 troops under arms. Their estimate of the Japanese occupation strength has varied with time, but in general it is around 600,000 men. This gives the Chinese, on paper, a superiority of five to one. If such a large Chinese force could be grouped into conventional armies and properly equipped and trained, it ought to be able to evict the enemy from their country.

At this time it appears that only limited Chinese armies are in being which could be counted upon to take the field and fight alongside Allied troops in an offensive campaign. Such forces will have to be completely organized, trained, supplied, and equipped.

The Kuomintang Party represents democracy. According to its own reports, in the territory held by its troops, over ninety-nine percent of the people do not belong to the party and have never voted for it. The leaders of the party hope that with time a democracy will arise. War, starvation and epidemics, and especially the enemy, prevents concentration of efforts in organizing a democratic system now.

The mass of people are not anti-Kuomintang, and certainly not pro-Japanese. Since time immemorial China has been a dictatorially ruled country. The people must be educated to what democracy is.

The second Chinese government is Communist. It is not recognized by the United Nations. It maintains an uneasy truce with the Kuomintang Party. It is strong in northwest China. It has its own military forces.

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In the last two years their activity has declined. Their excuse has been that they have failed to receive their proportion of Lease-Lend munitions, which they allege have been appropriated exclusively by the Chungking government.

At Nanking, Japan has set up a third government, favorable to itself. Its leader is Wang Çhingwei. His government is recognized by the Axis Powers.

The Nanking government has an army of considerable size, equipped by the Japanese. It is growing, and is employed in Japanese occupation duties. Reports from Chungking indicate that about one half of the occupation force in China, or about 300,000 men, are Chinese under the Nanking flag. Some have been employed on offensive operations.

From time to time, but not now very often, Japan undertakes campaigns into Kuomintang China. Some are in the nature of round-ups to destroy Chinese troops recently armed with Lease-Lend matériel before they become dangerous. Others are to seize or destroy supplies, particularly food.

At date of writing, military operations leading directly to China's aid are limited to efforts in north Burma to reopen the Burma Road. This would enable more supplies to be furnished the Chungking government. Chinese sources have criticized this plan as requiring too much time.

The Burma Road has been seriously damaged. It is not an all-weather road and can not be repaired during the rainy season, which normally extends from May to November. At the best, work could not start until November 1944, and it might take all of the following dry season to accomplish the required repairs. It would have to be closed during the ensuing wet season. It might be May 1946 before traffic in volume could move over the road. The Chinese estimate that it would take two years to transport over the road the supplies the Chinese armies need to enable them to meet the Japanese on something like even terms. It would then be 1948.

From this rather gloomy outlook, the Chinese conclude that the rescue of their country should not depend upon the Burma Road. In fact, it will not. There are other routes leading towards China, and the Allies apparently have no intention of confining their efforts to just one. Lines of operation lead southward from the Aleutian Islands, westward across the central Pacific, northward from Australia or through the China Sea. On all routes the Allies have forces massed which are making progress. A solemn promise has been given to come to the aid of China with every available man, ship, and gun as soon as the war in Europe is won.

There is danger that the time required for the rescue of China will be so long that she may succumb to the Japanese economic stranglehold before help arrives. This is a war risk which the Allies have agreed upon as one that must be accepted. The decision which was first announced at the Casablanca Conference in January 1943, and which has since been adhered to, was that with two wars in progress it was necessary to concentrate in Europe first and in Asia next.

For the moment China has exhausted the possibilities of saving herself. She can not with hope of success wage war against Japan alone.

China has had crises before, and has invariably solved them. She is the oldest political government in the world. History is far from repeating itself, but this long, impressive record gives hope that China will survive with the aid of her allies. When the time arrives, China should be able, with the aid that will be given her, to reestablish her independence and organize a sound government.

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**Improvisation is a test of your instructional ability.**

—Canadian Army Training Memorandum, No. 25

# GHQ Traffic Regulating System—SWPA

IN THE May issue of the MILITARY REVIEW Colonel A. R. MacKechnie, in his article "The Problems of Bases and Supplies in the Southwest Pacific," brings out clearly the logistical limitations on operations in that area. From the theater point of view the problem has been solved so far as possible by close regulation of all available means of transportation within the theater (air, rail, and water) together with a system of priorities, designed to move the maximum amount of troops and supplies through the limited-capacity ports and terminals to the various areas of operations.

The regulating system operates directly under GHQ, SWPA, and controls all troop movements, freight shipments, and individual travel, whether U. S. or Australian, Army, Navy, or Air Force, under a system of priorities which determines the assignment of available shipping or cargo space.

## ORGANIZATION

The regulating system consists of a Chief Regulating Officer with General Staff status in GHQ, SWPA, and a staff section of about thirty officers and forty enlisted men, comprising representatives of all Allied components in the theater.

Reporting directly to the Chief Regulating Officer are GHQ Regulating Officers at each port or terminal, each with his own staff of assistants.

Although this organization controls all means of transportation, the regulation of water-borne shipping in the movement of troops and cargo is the principal problem.

## REGULATION OF WATER-BORNE CARGO SHIPPING

In order to insure the maximum utilization of the unloading capacity of each port of destination, the most efficient utilization of the shipping available, and the unloading of cargo at each port in the order of its priority, the following procedure has been instituted:

*1.* Each supply agency having cargo ready for shipment to a port of destination reports the fact to the booking office (Transportation Corps) at the port from which the order will be shipped.

*2.* The booking office places the details of the shipment (bulk, weight, etc.) on a consolidated booking list which includes all other shipments so reported and destined for the same port of destination. Once a week a copy of this consolidated booking list, which also includes unshipped portions of all previous booking lists, is sent by air courier to the port of destination concerned.

*3.* At the port of destination the local Regulating Officer calls a meeting of representatives of all components served by the port (e.g., U. S. Army, Navy, Marine, or Air forces, or like Allied components). At this meeting shipping priorities are recommended by the representatives for each item on each booking list received by the port of destination—in other words, for all items awaiting shipment. Based on these recommendations, the local Regulating Officer assigns priorities. Priorities established on previous booking lists are disregarded; priorities of backlog orders are computed anew on each booking list.

*4.* The booking lists, on which priorities have been entered, are then returned by air courier to the Chief Regulating Officer at GHQ. Here the priorities are reviewed in the light of impending operations, the recommendations of Allied commanders concerned, or conditions not known to the ports of destination, and changes are made if necessary.

*5.* The approved booking lists are then returned to the ports of origin, where they become the authority for priorities of loading.

*6.* The port of origin takes no further action until shipping is assigned to it by the Chief Regulating Officer and earmarked for shipment of supplies to a particular port of destination. When this is done the port of origin loads the ship in accordance with the priorities on the booking list for that port.

*7.* Assignments of available shipping by the Chief Regulating Officer are determined after a study of port status boards in GHQ. A separate board is maintained for each port.

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On these boards are posted daily radio reports from each port showing the port rate for the preceding twenty-four hours (loading and discharge of cargo in deadweight tons), any changes in port capacity, and the cargo status of ships in port. Also shown on the status boards for each port of destination are movement data on ships in transit to the port or ordered to ports of origin to load cargo destined for it, with their approximate arrival dates at the port of destination and the estimated unloading times thereat (about six days for a Liberty ship).

*8.* Based on this record of port status, both present and predicted, and on the consolidated booking lists for each port, available ships are ordered to ports of origin to load cargoes for particular ports. *No shipping is assigned for loading until it can be predicted that unloading can be accomplished at the port of destination without delay.* Actual movement from port of origin to port of destination is arranged by the local Regulating Officer of the port of destination through Navy channels.

### Air and Rail Transportation

Air and rail transportation are also handled through GHQ Regulating Officers, priorities being established in each case by the local Regulating Officer at the destination terminal. An important feature of the system is its flexibility in changing means of transportation for shipments, where based on a study in GHQ of shipping backlogs, priorities, and means available it is evident that another means would be more expeditious. For instance, a shipment ordered by air might arrive quicker by surface transportation if the backlog of higher-priority air shipments and limited availability of air shipments and limited availability of air transport would cause a delay in delivery by air. A two percent emergency margin on all ship loadings is reserved until the last possible moment to accommodate such emergency shipments.

### Regulation of Troop Movements

The same procedure as outlined above is used to regulate troop movements, except that priorities of movement are established by G-3, GHQ. Actual movements orders, including movement to ports of embarkation, are issued by the Chief Regulating Officer. Assignment of shipping to troop movements is carefully checked to insure proper balance at the port of destination between supply shipments and incoming troops.

### Status Board Photostats

An up-to-date picture of the transportation situation is maintained in GHQ on port status boards, troop movement status boards, and digests of the manifests of all cargoes in transit. Daily photostats of the various status boards and cargo "consists" are forwarded from GHQ by air courier to the ports concerned; corrections are made thereon, and they are returned within twenty-four hours.

### Summary

Since the bottleneck of all shipping operations is the discharge capacities of the ports of destination, the present system was designed to work backward from the supply requirements of these ports and their capacities for handling incoming cargo. In this way, it has been possible to eliminate much of the "dead time" of available shipping. Whereas formerly it was possible that the unloading of a ship carrying low-priority cargo might be interrupted and delayed for days due to the subsequent arrival of ships carrying higher-priority cargo, shipments into each port are now tailored to fit the supply requirements of the port and its ability to discharge ships expeditiously as they arrive. The result has been an appreciable increase in the supply capabilities of the shipping available and a smoother functioning of the entire line of supply.

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**Today's adage is not "live and learn," but "learn and live."**

—Canadian Army Training Memorandum, No. 25

# Radio Communication in the Field

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BEFORE our entry into the present war, military experts and observers were of the opinion that the success of modern fast-moving military "blitz" tactics was in direct proportion to the efficiency of the signal communication system employed.

The secret of German successes in Poland, Belgium, and France has been attributed to the very efficient and reliable system of signal communication employed to coordinate and control the operations of the highly mechanized, fast-moving panzer divisions with the Luftwaffe.

The old approved and tested signal agencies such as were provided by wire lines, visual aids, messengers, sound, and pigeons were adequate for the needs of the slower moving armies of World War I. The military tactics employed in the last war enabled the signal agencies, as then known, to furnish adequate signal communication for the slower military machines which moved only a few miles in any operation.

The tactics employed in the present war produce changing battle lines ranging over great distances best exemplified in the African campaign. In operations of this type, moving hundreds of miles in a day required reliable signal communication between the commander and his widely separated ground divisions and between the commander and his air units. Obviously the effectiveness and efficiency of his command depended on a highly reliable system of signal communication.

Quite naturally, wire lines, which require time for installation, messengers, or other slow methods could not be effectively employed. An agency was required that possessed the desirable military characteristics of reliability, speed, security, and flexibility. Radio, the agency of signal communication possessing the characteristics of speed and flexibility, met the demands of modern military tactics. It is capable of transmitting voice infallibly over long distances, flexible to cover a wide range of frequencies, able to operate while in motion or at fixed locations under all types of weather conditions ranging from the heat and sand storms of the desert, the humidity of the jungles, to the extreme low temperature of the North. Radio is employed to provide the signal channels necessary for the control of the fast-moving tactics of modern war.

Since this important means of signal communication of modern warfare is employed for tactical control of both ground and air units, for flight control of aircraft, for fire control of weapons, for administrative purposes, for liaison, and for aids to air and sea navigation, it is essential to understand the proper employment of radio for correct and efficient operation, and to understand some of the limitations placed upon it by nature and the handicaps imposed upon it by man.

## RADIO CHANNELS ARE CROWDED

Nature, in creating the frequency spectrum, made provision for the frequency bands upon which depend radio communication channels but disregarded man's requirements and demands for radio channels in time of war on the limited number of radio frequency bands.

A brief study of the radio frequency spectrum appearing below indicates the limited number of radio communication channels available, especially when it is understood that almost all radio channels employed as signal channels for war purposes operate in the HF and VHF frequency bands. Each radio channel requires a width of approximately one-tenth of one percent of the frequency value in kilocycles (kcs). For example, if the frequency employed is 10,000 kilocycles, the band width would be approximately ten kilocycles.

Radio frequencies are divided into groups or bands. For military purposes they are divided into the following bands:

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*Frequency Bands*

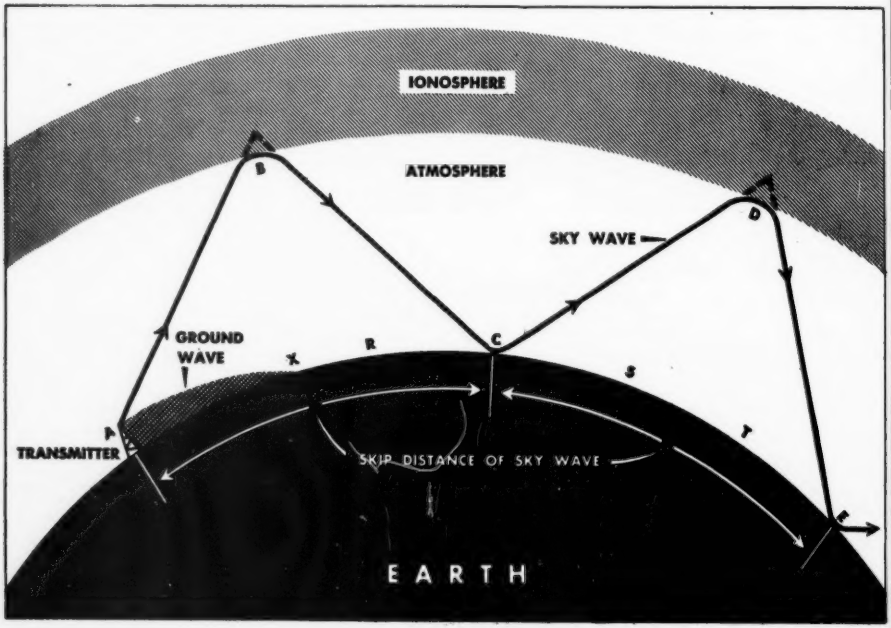
| | |
|---|---|
| VLF—Very Low Frequency | Below 30 kcs |
| LF—Low Frequency | 30 kcs to 300 kcs |
| MF—Medium Frequency | 300 kcs to 3,000 kcs |
| HF—High Frequency | 3,000 kcs to 30 mcs |
| VHF—Very High Frequency | 30 mcs to 300 mcs |
| UHF—Ultra High Frequency | 300 mcs to 3,000 mcs |
| SHF—Super High Frequency | Above 3,000 mcs |

Kcs = kilocycles per second
Mcs = megacycles per second
1,000 cycles = 1 kilocycle
1,000,000 cycles = 1 megacycle

Frequencies above 30 mcs are limited in range and are classified as "line of sight" frequencies. United States commercial broadcasting stations operate within the medium frequency band varying from 550 kcs to 1600 kcs.

### Radio is Unpredictable

A commercial broadcast station in the United States received a letter from a marine stationed somewhere in the Southwest Pacific informing the station of his enjoyment in being able to receive a high frequency broadcast transmitted by his home-town radio station. The power output of this station's high frequency transmitters precluded reception at such great distances and confirms the fact that radio is sometimes unpredictable. On the other hand, two British units operating in the African desert early in 1940 found they could not carry on radio communication even though they were less than seventy miles apart. The power output of the transmitter was increased and new antennas employed, but still communication could not be carried on between the two units. Friendly stations located many hundreds of miles away heard the two units and in fact enjoyed very good reception. The problem of signal communication in this instance was easily solved by employing the receiving stations many hundreds of miles away as relay points for the traffic from these two closely adjoining desert units. The enemy unquestionably also enjoyed good reception.



This phenomenon in radio is known as the "skip distance" or the area of "no signal" and has been known to scientists for a long time.

Possibly one of the best illustrations of the "skip distance" concerns the doughboy stationed on Guadalcanal who happened to tune his receiver to his favorite American short-wave broadcast station and to his amazement picked up the World Series broadcast. Series games are also broadcast after the event by short wave to our armed forces throughout the world. Naturally, knowing the outcome of the World Series before the regular short-wave broadcast enabled him to give vent to his gambling instinct and place bets with other soldiers at great odds without danger of loss to himself.

From a brief study of the graph the reasons for the apparent unpredictability of radio should be evident.

A radio wave leaving the antenna of the transmitter at A may be considered for our purposes to be composed of two parts. One part of the radiated energy, called the ground or surface wave, travels along the surface of the earth in all directions. The ground wave is depended upon for almost all military field radio communication. A radio receiver in the ground wave area, shaded on the graph, will receive a signal from the transmitter at A. The other part of the radiated energy, called the sky wave, travels upward into space, strikes the ionosphere, and a portion of the wave is reflected or refracted back to the earth as shown in the graph.

It is beyond the scope of this article to go into a technical discussion of this phenomenon. However, the following is quoted from a Technical News Bulletin of the Bureau of Standards:

"The ionosphere consists of several layers of ionized or electrically conducting air from 60 to 300 miles above the earth. These layers act as reflectors for radio waves and make possible radio transmission over long distances.

"Depending on the degree of ionization of a layer, there is an upper limit to the frequency which, when the waves are sent straight up, may be reflected from the layer. Radio waves of frequencies greater than this upper limit, or critical frequency, go completely through the layer and pass entirely out into space. The critical frequency for each layer varies with the hour of the day, season of the year, and also over a long period which seems to be associated with the eleven-year sunspot cycle.

"The air in these layers is ionized principally by ultra-violet light from the sun. Consequently the critical frequency would be expected to be greater during the day than during the night and greater during the summer than during the winter.

"In addition to the critical frequencies, the heights of the layers, and the amount of absorption of the radio waves play an important part in long-distance radio communication."

The sky wave leaving the transmitter at A strikes the ionosphere at B and is reflected to the earth at C. The earth in turn reflects a portion of remaining radiated energy upward into space where it is again returned to the earth at E, the process continuing until the energy is lost in space or completely absorbed. Transmitted radio waves (sky waves) from A will be audible to a radio receiver at points C and E, but at the points R, S, and T or any of the intervening spaces from X to C and from C to E, they will not be audible to a radio receiver. These areas of no signal are known as the "skip distance" of the sky wave.

The examples cited above emphatically illustrate that low power radio transmissions may be received over great distances and remain inaudible to relatively nearby receiving stations. Signal security can be jeopardized because low power transmissions will not insure against the enemy's ability to listen to this traffic even though he is a thousand miles away, particularly in ranges between 1,000 and 30,000 kilocycles.

### Mutual Interference

Consider any army division with the numerous radio sets it will have in operation, or better yet, an armored division which may

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have hundreds of radio sets of only a few different types and frequency ranges. Obviously, radio interference among the stations within the armored division will result unless proper control is exercised over the number of stations in operation at a given time or place. Consider, for instance, the final phases of the Tunisian campaign—a fast-moving situation in which both friendly and enemy operations depended on radio. Mutual interference was one of the resulting problems undoubtedly kept to a minimum by proper allocation of frequencies and strict radio discipline.

The problem of mutual interference is multiplied many fold on a joint navy, air, and ground force operation. Radio will be the principal means of signal communication employed by all forces until land lines can be installed. Cooperation, coordination, and planning must of necessity, to insure successful operations, be foremost in the allocation of frequencies in a joint maneuver for the prevention of mutual interference to signal radio channels.

Among some of the methods employed to control mutual interference are the following: limitation of the power output of the transmitters, employment of a system of time priorities for suppression of stations which could probably interfere with important transmitters, strict radio discipline, proper preplanning, and coordination. Frequency allocation must be thoroughly coordinated and correctly planned, and must be flexible to meet *all* conditions of interference.

## Radio Discipline

It is not overemphasizing to say the course of recent history has hinged on radio discipline. General Ronge of the Austrian Army, talking of conditions prevailing in 1914 before the famous Battle of Tannenberg, said concerning radio transmission: "An effective, unsurpassed source of information was, however, opened to us by the Russian radio messages, which were transmitted with a carelessness similar to that of which the Germans were guilty when opposite the French troops at the beginning of the war," and Lieutenant Colonel Philip Neame in his book, *German Strategy in the Great War*, also mentions these Russian radio indiscretions before the Battle of Tannenberg.

It never happened before and probably will never happen again in the history of signal communication as it happened in the Battle of Tannenberg, that so much important information concerning the dispositions and grouping of entire armies of one side would be betrayed to the enemy because of the failure to take proper measures to insure radio discipline.

General von Falkenhayn of the German Army states in his memoirs of World War I: "Intercepted radio messages enabled us from the start of the war until the end of 1915 to follow all movements of the enemy on the Eastern Front, and our daily orders were issued accordingly."

In 1939 a very important ammunition dump was left undestroyed by the Poles because a telephone call via radio channels had informed the commanding officer of a demolition party to hold up destruction of the dump until a retreating Polish unit obtained some special powder. Shortly thereafter the demolition party was surprised by a German unit. In this instance it was later determined that the call had not been verified by authenticators. Here also radio discipline failed.

Because of the limited number of radio channels available, there is a great urge to search the spectrum for an open radio frequency. This practice is dangerous and can be avoided by application of radio discipline. Obviously a frequency found by "hunting" on the spectrum may be a frequency that has been allocated for other purposes. The use of unauthorized and stolen frequency can prevent necessary signal communication for either ground or air operations and jeopardize any operation or an entire command. Imagine the confusion and chaos that would result if all commanders in any theater permitted the practice of searching for and employing stolen channels. The enemy would dance with glee.

An effective means of enforcing radio dis-

cipline is by use of monitoring or listening stations. The monitor stations should be operated by trained radio personnel who should know all the tricks of radio operating. The many channels to be guarded or monitored may be chosen at random at any hour of the day or night. All pertinent data on infringements or discrepancies are recorded, pertaining to unauthorized and off-frequency transmissions, radio procedure not in accordance with Field Manuals, and malfunctioning of equipment.

There is no such thing as an unimportant radio transmission, for the most trivial message may give away information that can change the course of events. For instance, in 1914 the French monitor or listening station located in the Eiffel Tower heard the Second German Army passing on information to the German cavalry who were advancing into the gap between the British and the French Fifth Army. Brigadier General E. L. Spears, in his book, *Liaison 1914*, comments as follows on this operation:

"The first information of this new and terrifying development reached us at Laon at 9:15 a.m., when the General Headquarters telephoned that an enemy wireless message had been intercepted ordering a German cavalry corps to cross the Oise at Bailly and march on Vauxaillon, which lay some fifteen miles southwest of Laon where we were sitting at that moment. . . Information that came in during the afternoon did nothing to allay our anxiety. Intercepted enemy wireless showed that three German cavalry divisions had grouped their first line transport about Compiegne. If the enemy cavalry moved at any speed they would reach Vauxaillon hours before the retiring French infantry, completely outflanking our left. They would cut the Laon-Soisson Railway and be only a very short distance from the Aisne, from which the main body of the Fifth Army was separated by many miles of difficult hilly country. If the Germans occupied the passages of the river before the Fifth Army, they would cut off its retreat to the south."

The monitor station in the Eiffel Tower continued intercepting German wireless messages, one from the German cavalry which stated that it needed nails for shoeing horses immediately.

General Spears states that the Fifth Army owed its extraordinary escape to a lucky accident. The inference drawn from the statement suggests the importance of radio silence, for even an isolated scrap of information, such as the need of nails for shoeing, can be the turning point of a war. Perhaps a scrap of information obtained here and a scrap of information obtained there may be meaningless, but the scraps of information so obtained may fit into a pattern to form a complete picture enabling the enemy to obtain the detailed and comprehensive plans of an operation.

The British in the early days of 1941 had been in the habit of transmitting names of war casualties to higher headquarters. The Italians listening to these reports, meaningless in themselves, were able to determine that important British units had been withdrawn from Africa, thereby enabling them to defeat the British.

Unauthorized transmissions and "jabbering" over the radio is a valuable source of information to the enemy. Two sergeant radio operators of British units stationed near Cairo had formed the bad habit of jabbering over the radio. Main topics of discussion concerned two beautiful American girls they had met in Cairo and the plans they had both made with the two girls for a future weekend. In the course of events one of the British units received secret orders to surprise the Italians with a dawn attack on a Sunday morning. The radio sergeant of the attacking British unit, by the easy expedient of continuing to employ the radio for unauthorized transmission to the other radio operator, requested him to express the necessary regrets to the waiting American girl in Cairo. Alert Italian radio monitors, having previously heard all the romantic details via the radio waves, reasoned, and rightly so, that the sergeant's change in plans had been interrupted by decision of higher authorities to move the unit. "Move" in this case meant only one thing—attack. Thus,

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the element of surprise, so necessary in the attack on that Sunday morning, was lost, and this was a contributing factor in saving the Italian units from complete annihilation.

Valuable military information was disclosed to the British desert units by Italian radio operators who announced the arrival and departure of a visiting chaplain. It was a simple matter for the British to find out the number and location of all Italian units in the area.

Another source of enemy information is phrases coined on the spur of the moment; "four horses out of commission," "three horses have broken legs," or "feed needed for the horses" fool no one, least of all the enemy.

Proper training and radio discipline will prevent the enemy from securing information from our radio transmissions. It is well to remember that the enemy listens to or monitors all of our radio transmissions regardless of their importance.

Preventing the enemy from obtaining information from our radio transmitters operating in the field is the responsibility and duty of all radio personnel.

On the transmitter of a field radio station in New Guinea is a large sign reading, "Remember the enemy is listening." That phrase is applicable to all personnel in every theater.

In conclusion it may be said that in spite of the limitations placed upon it by nature and the handicaps imposed upon it by man, radio, if correctly employed and effectively utilized, is a reliable and flexible means of signal communication providing the necessary channels to control the fast moving, highly mechanized tactics of modern warfare, either on the ground or in the air.

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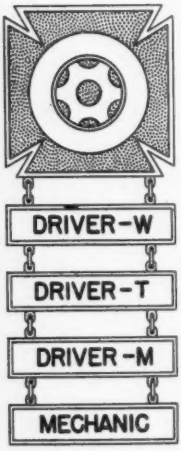
## Drivers and Mechanics Award

Prepared for the MILITARY REVIEW under the direction of the Director, Maintenance Division, Army Service Forces.




UNIT commanders who want to encourage better first and second echelon maintenance should keep in mind the award for qualified motor vehicle drivers and mechanics authorized by War Department Circular 248, dated 28 July 1942.

The basic badge with appropriate bar may be given anyone regularly assigned as driver, assistant driver, or automotive mechanic who can qualify under the requirements of the circular. The prospect of winning the award should serve as a real incentive to more faithful performance of organizational maintenance duties.

Over a half million of the badges have been awarded through Philadelphia Quartermaster Depot, but there are still many qualified drivers and mechanics eligible for the awards who have not had recognition.

The nomenclature and Federal Stock numbers of the badge and bars are as follows:

Badge, Qualification, Motor-Vehicle Driver, Mechanic—71-B-197-50.

Driver-W, for wheeled vehicles—71-B-1212.

Driver-T, for track or half-track vehicles—71-B-1213.

Driver-M, for motorcycles—71-B-1214.

Mechanic, for automotive or allied trade mechanic—71-B-1229.

These awards may be requested through any local Quartermaster Officer.

# Corps Artillery Fires in Combat

LIEUTENANT COLONEL D. S. SOMERVILLE, *Field Artillery*
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CORPS artillery is the general support artillery of the corps. It is the first reserve of the corps commander, instantly available at any point of the battlefield within range. It is the most powerful single force that can be so employed. Although there are some targets that corps artillery will attack with single batteries or even single guns, it is capable of massing large numbers of weapons on a target anywhere along the corps front and should habitually be used in mass.

### CORPS ARTILLERY MISSIONS

Corps artillery executes two general types of fires:

*1. Fires in support of the corps as a whole.*—These include counterbattery, long-range interdiction, etc. Targets are obtained by long-range observation, higher echelons of intelligence, map study, etc., or may be prescribed by the force commander.

*2. Fires reinforcing the division artillery.*—These are against targets reported by division artillery observers and are usually fired on call, although fires requested by the divisions are also included in prearranged schedules. Reinforcing fires constitute the majority of missions executed by the corps artillery.

Having received the plan of the corps commander (which should include the decision as to a silent or active counterbattery policy), the corps artillery commander recommends plans for the employment of the artillery with the corps. When time permits he prepares an artillery annex to the corps order, in which, in his dual role of corps staff officer and corps artillery commander, he prescribes to both corps and division artillery such coordination of fires, survey, communications, ammunition supply, etc., as he deems necessary to the success of the operation. While he will specify the fire plan of his own corps artillery, he will not interfere in any division artillery fire plan except where necessary to insure coordination between divisions or between corps and divisions. It may be necessary, however, to require some or all of the division artillery to assist the corps artillery during certain phases of the preparation or counterpreparation.

### ATTACHMENTS TO DIVISIONS

Whenever possible, corps artillery is controlled centrally. But when extreme frontage, accidents of terrain, and hazardous communications make this impossible, control is decentralized to divisions; suitable types and quantities of artillery are then attached to divisions to enable them to execute for themselves those missions that normally are conducted by corps artillery. The size and composition of each attachment is governed by the importance and severity of the mission of the particular division; it may include extra staff personnel, an observation battery, and extra headquarters and headquarters batteries for communications and control.

### COORDINATION OF FIRES

The degree of coordination of artillery fires between division and corps depends on the planning time available, but in no case is there any justification for its complete absence. If time is short the corps artillery commander estimates what portion of his artillery he will need for his own fires (usually including most of the long-range artillery), and assigns suitable zones of fire to the remaining groups, directing the latter to reinforce specified divisions and to deal direct with them for planning and execution of reinforcing fires. However, when ample time is available, the following procedure is recommended. The corps artillery S-3 blocks out on his work sheet the fires required for counterbattery, long-range interdiction, and other corps fires directed by the corps artillery commander or the corps commander. (He usually can do this long before division plans are perfected.) He also can determine

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how much division artillery will be needed to assist in counterbattery and when it can be released. He then informs the various divisions as to what fire power he will need from them and when it will be released, at the same time telling them what units of the corps artillery will be available to reinforce their fires and at what times. (Many corps fires, such as repeat counterbattery, interdiction, etc., can be shifted, within reasonable time limits, to accommodate the divisions.) He transmits to them, in addition, instructions for lateral coordination specified by the corps artillery commander. The division artillery is now able to make plans with some degree of confidence that they will not have to be revised materially, and the corps artillery S-3 can send his schedule of corps fires to his own groups, indicating that they will deal direct with the specified divisions for the planning and execution of fires during the blank periods marked on their schedules. This whole procedure has many advantages. It enables both division and corps to start work promptly and with definite information. It provides maximum assistance to divisions as they themselves so plan it. And it decentralizes staff work. It is implicit in these remarks that the whole purpose is to give as much help to the division artillery as possible, once corps fires have been determined, this help to be based on what the divisions themselves want. It is always better, when time permits, if the artillery commanders can confer informally as soon as the plan of operations is known. In a sense, such conversations are the real essence of all large-scale artillery coordination. Note that the method described above concerns chiefly the preparation and such other fires that can be prearranged. In the organization for combat the necessary reinforcing missions are specified; these take care of the later fires, most of which will be on call.

To insure safety of troops, assist planning, and avoid duplication of fires, the corps artillery commander may prescribe a coordinating line dividing the battlefield in depth between the zone of responsibility of the division artillery and the zone of responsibility of the corps artillery. Such coordination is feasible only in static or defensive situations, or during the planning period preceding an attack. Its practical effect should be to require the corps artillery (and division general support artillery as well) to check on the safety of all fires it initiates short of this line. The direct support artillery, being informed by its forward observers as to the exact location of our advanced elements at all times, need not abide by this line for targets of opportunity.

### General Rules for Employing Light, Medium, and Heavy Artillery

Any discussion of corps artillery fires involves the question of organization for combat. Unfortunately there is not time here to go deeply into this important and controversial subject. Suffice to say that in almost all situations it is best for corps to attach its light artillery to divisions, as they can more profitably employ its high rate of fire and limited lateral range; once so attached, this artillery becomes division artillery. The corps medium artillery is best employed on reinforcing missions. The heavy artillery, with its power and lateral sweep, is usually kept busy on purely corps fires. While all corps artillery is usually in general support, and, as such, can be massed as needed anywhere on the front of the corps, it is customary to assign to designated units (particularly the medium artillery) the mission of reinforcing the fires of specified division artilleries and of answering calls for fire direct from them. (Such instructions require the reinforcing unit to establish communication and liaison.) The practice of putting corps artillery units in direct support is not advisable; the desired effect can be obtained by means of reinforcing missions without sacrificing corps control of displacements or causing any misunderstanding with the reinforced commander.

### Factors Influencing Prearranged Fires

As was stated above, coordination of fires is dependent upon time available. This is not

quite the whole picture, for it is also dependent on the amount and accuracy of our intelligence and on the strength of the enemy installations. Obviously, corps can plan prearranged fires as to location only when targets are accurately known; until division plans are received it can prearrange its own fires as to time of execution only when the exact moment of delivery of fire is not vital or when the rate of advance of the supported troops can be predicted accurately. As a general rule, it is believed impracticable to attempt to set up a time schedule for reinforcing fires beyond the moment of the assault of the first important enemy position in each regimental zone of action. Fires, although located previously, should thereafter be on call from competent observers. The system of having a set of time schedules, each covering a partial phase of the operations and with starting times advanced or delayed as the situation dictates, is to be condemned. It is apt to lead to trouble, for control is dependent upon complete and unfailing communication with all units at all times.

### Corps Artillery Intelligence

To return to the subject of locating targets. Reinforcing missions are usually initiated and observed by division artillery observers, but the location of deep targets and the adjustment or surveillance of fires on them is a much more difficult matter. For these the corps artillery employs all available sources of information and observation. The observation battalion, with its sound and flash teams, is the basic target-finder, particularly in counterbattery. Air photos assist greatly. Intelligence from troops, including shelling reports, are of help. Map study often indicates interdiction or destruction missions as well as the probable locations of enemy installations. All these sources and agencies are utilized. It is obvious, therefore, that the problem of correlating and evaluating the intelligence that flows into the corps artillery S-2 section is a baffling one, particularly where it applies to enemy artillery. Much of the fragmentary information can be correlated by time coincidence, and all troops must be impressed with the necessity of including in their reports of enemy artillery activity the *exact* time such activity occurred.

### The Artillery Preparation

Having discussed some of the general problems of corps artillery fires, let us turn to a more specific analysis of the subject. Take for illustration the corps artillery part in the preparation. As was implied above, the force commander must prescribe the duration of the preparation if one is to be fired. The corps artillery commander organizes the preparation, in which his staff and his weapons play a dominant part; not only does the corps artillery staff work out all general coordination, but it may have to draw up detailed fire plans and schedules for both corps artillery and division artillery for the counterbattery periods of the preparation.

In the first phase, the corps artillery, reinforced as necessary by division artillery, gains ascendancy over the enemy artillery; units not required for counterbattery interdict routes and neutralize enemy systems of command, communication, and observation.

In the second phase, corps artillery maintains neutralization of the hostile artillery, while the division artillery hammers the enemy command, communication, and observation installations, his reserve areas, etc.

In the third phase, the corps artillery continues counterbattery, lending such assistance to the divisions (reinforcing fires) as it can. The division artillery concentrates on those enemy forward defenses that most seriously threaten the success of the attack.

### Reserve Fire Power

Throughout the preparation there will be many enemy weapons and installations that disclose themselves for the first time. It is therefore necessary when allocating missions to units to keep available a surplus of fire power for attacking these newly discovered targets. Probably the best advice is not to keep a portion of the artillery silent awaiting the appearance of new targets, but rather to

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keep it all in use; those units which share missions with others can be shifted over to the new targets without causing gaps in the fire plan.

### Listing Missions

In a deliberate operation the S-3 of the corps artillery has a tedious task in working out all this coordination we have described. He must utilize some form of master work sheet divided into time intervals and listing the fire power of units so that he can know exactly how much he is demanding from each at any time. Usually the corps artillery will send down to the corps groups (or brigades) fire plans in the form of a directive, rather than attempt to prescribe the precise method and time of each mission. For example, it is not material in which sequence a group masses its fires on a number of enemy batteries on which it alone is conducting counterbattery; it is enough to prescribe the targets, number of battalions to fire, and the time limits within which the missions are to be fired. However, where it is desired to mass the surprise fire of different units it is necessary to prescribe the exact time of initial impacts. It is also necessary to specify the lifting time of fires supporting the attack on a position, regardless of their duration. Barrages fall into this latter category.

### Survey

A word here is necessary on the subject of survey. The observation battalion (reinforced if necessary) is the corps artillery survey agency, and its commander should be a frequently consulted staff officer. He should recommend the survey plan to be incorporated in the corps artillery order. In addition he establishes a survey information center, where both corps and division artillery units may come for help or information. The observation battalion brings control down to each corps battalion (and to the artillery of each division), and in addition performs such target area survey as it can in the time available. This sequence of procedure is stated here in an attempt to correct the general overemphasis on complete target area survey. So long as the battalions have been tied together accurately for location and direction the corps artillery can mass observed fires, such as those on targets reported by forward observers. But without this tying together of the weapons no massing of any kind can be performed. Once units are accurately laid, registration by a single piece will theoretically tie in the target area (although this would be an impractical minimum solution). There is no intent here to say that we can fire surprise or unobserved fires without having the targets accurately located. The only point is that much of our locating comes later on in the form of fresh intelligence reported *by coordinates* computed at the time. These targets were not surveyed in beforehand; it would have been impossible, for they were not known. Lastly, even in a decentralized situation it is highly desirable to prescribe such policy or procedure for the separate units as will facilitate their recapture by corps on a common basis when centralized control is resumed. This particularly applies to survey, else the various divisions will each set up their own survey plans, assumed datum planes, etc., and make it difficult to put all on a common grid later.

### Communications

While it is a platitude to say that flexibility and effectiveness of fire depend on communications, the remark is particularly applicable to corps artillery. Once the attack is launched the corps artillery battalions must depend on other units for the majority of their missions; corps artillery observation posts will not normally furnish as high a percentage of targets as do those of direct support artillery, even counting in the flash observers. Moreover, because of the number of units involved, corps artillery fire direction itself requires very flexible communications. For this latter reason it is becoming apparent that in the fire direction of large masses of artillery the radio is much more than merely an alternate or substitute for the telephone. The general radio plan, similar to ones already successfully used in combat, is about as follows: A common frequency known as the Corps Artillery Control Channel is set

off as a listening frequency on a set (SCR 193) at corps artillery fire direction center, each corps group fire direction center, each corps battalion fire direction center, and at the observation battalion command post. Thus the corps artillery can broadcast missions or intelligence to all its units simultaneously. In addition, by prearrangement the channel is preset (but not always as a listening frequency) at each division artillery fire direction center and at each organic direct support battalion fire direction center. Thus, division artillery observers can adjust the fire of any or all of the corps artillery, and vice versa, using direct radio between the observer's battalion set and the unit firing. (Sensings by forward observers must be relayed at their home battalion fire direction center from the 609 channel to the corps channel; when necessary, the division artillery set or any other intermediate set can act as a relay.) This system of radio fire control makes it possible to mass all the corps battalions within range as quickly as to fire one. The location of the target and the results of fire are also heard simultaneously by those units not participating. Of course, normal wire circuits will still be available and can be used often in conjunction with the radio for fire control, especially when arrangements must be made through the corps artillery liaison officers with the division artillery. It should be noted that the corps artillery has a liaison officer at the command post of each division artillery, one at the photographic squadron working with the corps, and one with the corps G-2; these officers all have a wire back to the corps fire direction center. In addition, there is a liaison officer with both radio and wire communication sent to each division artillery by any corps unit reinforcing its fires.

### Massed Fires

A few remarks may be appropriate here on the subject of massed fires. As a general rule there is no reason to specify more than one impact point, regardless of the number of battalions firing, when the target is less than 400 yards square, as dispersion and minor errors will give adequate coverage. When the target is larger, separate impact coordinates should be worked out to conform to the outline of the area. Observers must be trained to give complete descriptions of those targets requiring massed fires—the frontage, depth, portions covered with high trees, etc.—so that the fire direction center can plan the most effective coverage. Observers should also be trained to restrain the natural temptation to bring down *some* fire right away on targets deserving heavy concentrations. A tank park that has occupied a grove of trees for eight hours will be there for the next eight minutes, which is ample time in which to obtain four or five battalions for surprise fire; but if the observer brings down a battery or battalion on it the target will disappear. Something of the same remark applies to the tendency of observers to stop fire too soon, imagining effect that does not exist. Perhaps both of these faults result from a system wherein the S-3, like Samson, must ask someone else, with eyes, where to apply his strength. There is no substitute for the experience and judgment of the observer.

### Counterbattery

Counterbattery is the most important of the purely corps fires. Execution is not difficult, but locating the enemy artillery is difficult indeed and often will depend greatly on the observation battalion. Reports of present campaigns show that sound ranging is becoming more and more the mainstay of counterbattery intelligence; the lack of counterbattery fires, as indicated by unit records, has more than once been because sound ranging could not obtain accurate locations during certain phases of operations. The Russians have had considerable success with their sound plots; indeed, the heavily wooded terrain in which they have operated much of the time has made visual observation very difficult. Sound is normally accurate up to ranges of about one and one-half times the length of the sound base. The observation battalion commander should be told, like any other artilleryman, where to focus his main interests; it is often necessary to "cock"

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sound bases in a given direction for maximum results. Counterbattery fires are no different from other massed fires. They should be intense initially, and it is desirable to synchronize the arrival of the first volleys from all units firing. The corps artillery control channel lends itself very well to this task; a time signal can be broadcast, say, sixty seconds before the time of impacts, and each battalion S-3, knowing his time of flight, subtracts this time from sixty seconds and fires at the proper instant. This synchronization is desirable, for where personnel work very close to their foxholes most of the casualties will occur in the first one or two seconds it takes them all to get under cover. At least one battalion should mass on each enemy battery as a very minimum; four or five is even better. Neutralization can be maintained thereafter by a much smaller volume of fire delivered at irregular intervals. While medium or heavy artillery is preferable for counterbattery, light artillery makes a very satisfactory substitute. Several types of ammunition are effective, particularly when combined. High explosive time fire plus gas shell plus some time white phosphorus, with a sprinkling of impact high explosive, is about as vicious a combination as can be thought up; three or four battalions serving up this mixture produce results.

### The Necessity for Strong General Support Artillery

In conclusion, it is the viewpoint of this article that corps artillery, as the general support artillery of the corps, should be powerful. There has recently been reported a corps action wherein the division artillery, disregarding its schedules, picked up and followed its rapidly advancing infantry early in the first day of battle. It was not in position to fire the remainder of that day. Had there not been a powerful central artillery reserve under the force commander, which was able to sustain the artillery support during this interval, the attack might have failed. It has been stated before that the corps artillery is the most powerful single assistance that can be lent quickly at any point. To dissipate it in the form of unnecessary attachments to divisions is to subtract just that much power from the hammer blow which it can lend on call. In addition, corps artillery should cover the flanks, the deep areas, the avenues of possible enemy counterattacks—all the "general utility" tasks—so that the division artillery can be free and unhampered in its mission of attacking those targets which directly impede the advance of its own troops. The corps artillery, properly used, should have such flexibility of fire that the need for inter-division borrowing of fires, especially in the offense, is materially reduced.

### Policies

One final word as to policies. The good corps artillery commander should combine some of the characteristics of a Roger Babson, a Sherlock Holmes, and a Machiavelli. He must require orderly and systematic indexing of intelligence; he must piece together clues to the location of enemy installations; and he must seek every way to confuse and outguess the enemy. He must never allow his fire patterns to become fixed and set, else he will educate the enemy and lose much of the effect of his fires. A lot of neutralization can be obtained by pure suspense, for a soldier who never knows when it is safe to come out of his foxhole stays there just as surely as if the shells were still raining down around him. "Never fire it the same way twice" is a pretty good rule of thumb.

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**At all times and in all seasons of the year, I consider it my duty to go out to meet the enemy, to strike at him, and to maintain decisive operations. . . If the word is given to advance, then I do not know what it is to be tired, cold, or hungry.**

**—Field Marshal Alexander Suvorov, Russian Army, 1729-1800**

# Allied Military Government in Sicily

Prepared for the MILITARY REVIEW by Civil Affairs Division,
War Department, Washington, D. C.

ALLIED Military Government (AMG) as carried out in Sicily represented the first time in history that two great powers merged army personnel into one combined organization to provide civil government over an enemy population.

It was also the Allies' first effort, in World War II, to create a military government in an enemy homeland.

Because of these factors, there is a natural interest in the methods adopted by AMG, and in the results obtained. In this paper, primary emphasis is laid on the tactical organization of AMG, its integration with other units of the armed forces, and the actions taken as the armies advanced.

It was standing operating procedure for AMG officers to land on D-day with combat troops, to stay with them over the miles of fierce fighting, to enter smoking towns while snipers were still pegging bullets.

Civilian problems in the paths cut by our armies across Sicily were more severe than those encountered in any previous warfare. Whole cities were smashed to complete ruin by aerial bombs and artillery shells. The retreating enemy looted food stores, took all motor transport, and blew up rail and roadway bridges, paralyzing civilian economy.

The people fled to the hills during these onslaughts, but they streamed back as soon as our troops entered. They wept over their ruins and their dead who had not escaped, but they could do little for themselves. They were dazed, war spent. They cried out for food, for shelter. Their officials (those who had not fled with the enemy forces) kept saying only: "What do you want us to do?"

The rules of land warfare require that army commanders must show a humane consideration for civilians. But even if this were not so, and commanders were cold to civilian woes, their own self-interest would dictate the need for a civil affairs organization.

Unfed, unsheltered civilians at an army commander's rear after a very short time would develop into a military menace to lines of communication, would riot against troops billeted in the towns, loot supply caravans and dumps, commit acts of sabotage on military telephone lines, bridges, and vehicles, and give information and other comfort to the enemy.

Before D-day in Sicily, as AMG officers were being attached to tactical units, they encountered lack of enthusiasm from some commanders who failed to sense the scope of the civilian problems ahead. But the campaign was not a week old before the same commanders were calling frantically for more civil affairs personnel.

And in the records there are many letters from army and corps and division commanders expressing highest appreciation for the work of AMG.

The AMG planning for the invasion of Sicily centered at Allied Force Headquarters at Algiers, under the Military Government Section, of which Brigadier General Julius C. Holmes was Chief.

A training school and planning section was established at a winter ski resort, a tiny French North African village on a mile-high mountain top near Algiers, overlooking the Mediterranean. This was under command of Major General Lord Rennell of Rodd, whose father was a long time British ambassador to Italy, and who had lived many years of his own life in Italy. Rennell was designated "Chief Civil Affairs Officer" for the 15th Army Group under which there were two task forces, Patton's American Seventh Army, and Montgomery's British Eighth Army.

Brigadier General Frank J. McSherry, United States Army, was named as "Deputy Chief Civil Affairs Officer."

Several hundred American and British officers—many of them trained at the army civil affairs schools at Charlottesville, Virginia, and Wimbledon, England—were gathered at Chrea late in May 1943. They were deliberately thrown into close association. Or-

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ders were to mix nationalities at mess tables; beds were assigned in the billets alternately to Americans and British.

Some of the British officers had had experiences in military government in Abyssinia, Eritrea, Somaliland, and Tripolitania, and their discussions were most valuable. Differences in temperament, in customs, and above all, in army methods and procedures, brought difficulties, but there were advantages in providing a unified administration and a harmonized program of occupation.

An administrative and planning group was assembled and engaged in the preparation of proclamations and orders, and of detailed instructions for the military government of Sicily.

A basic plan was adopted, under which objectives were stated as follows:

A. To restore law and order and normal conditions among the civil population as soon as possible; and within available resources to arrange for necessary food supplies for them and where necessary provide relief and maintenance for destitutes.

B. To assist in making available to the occupying forces the economic resources of the territory.

C. By providing specialized personnel, to relieve combat units, insofar as is practicable, of the necessity of handling civil administration.

D. To promote political and military objectives of the Allied Forces in connection with future operations through efficient government of the territory and the application of the policies laid down by the Commander in Chief.

General Alexander, as Commanding General of the 15th Army Group, was designated by General Eisenhower as Military Governor. The task force and sub-task force commanders, down to divisional levels, were given final responsibility and authority for military government in their zones of operations. Throughout, the military chain of command was adhered to.

Thus, while General Alexander was overall military governor, and issued civil affairs directives to his subordinate commanders, the two army commanders, Patton and Montgomery, held full responsibility in their zones, and gave orders to the corps commanders. The latter, in turn, wielded full authority within the corps boundaries. But divisional commanders likewise were held responsible for civil affairs in their zones.

At each echelon, civil affairs officers were assigned and operated fully under the authority of unit commanders.

The staff status of the AMG officers varied in the different formations. At the army group level, Major General Lord Rennell was a special staff officer, and at the two army group headquarters the civil affairs officers held the same status, reporting through the chief of staff in each instance.

At the corps echelon this was varied. At II Corps, Seventh Army, the AMG officers were placed in the section of the Judge Advocate, who functioned actively in charge of civil affairs for General Bradley. The British corps held civil affairs on the staff level, although the administration was much looser at the start, and direction flowed for the most part from Eighth Army headquarters.

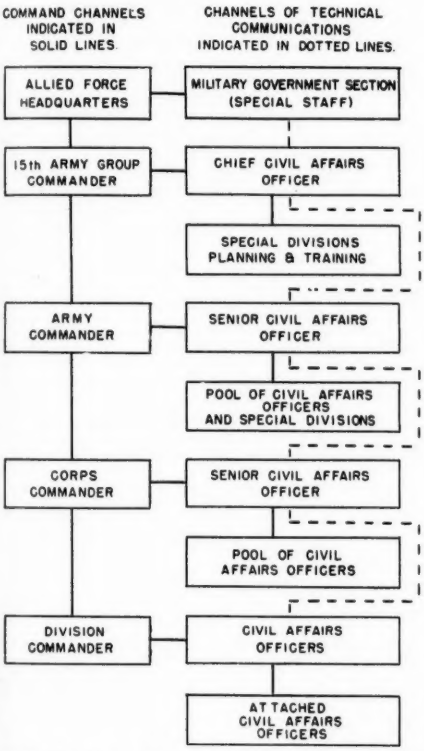
On the divisional level, some commanders dealt directly with the AMG staff officer. In other divisions the staff function was conducted through either G-1, the Judge Advocate, or, as in one case, through the Provost Marshal.

There was no staff organization for civil affairs in units below the divisional level, although in some instances civil affairs officers were attached temporarily to brigades, and even to regiments, so that they would be available immediately upon the fall of a town to take over civil problems.

While thus all military matters moved through normal command channels, provision was made for technical information to be passed directly through the AMG echelons. The Chief Civil Affairs Officer used these direct technical channels, for example, to guide fiscal and economic policies. An instance might be cited in the price of wheat.

Widespread complaint against the low price of wheat was made by farmers in all sections of Sicily first occupied by Allied troops. This was a compelling factor in causing hoarding of wheat, which was desperately needed for the feeding of civilians in the cities. Obviously, division and corps commanders could not each fix the price of wheat in their zones without causing chaos. Indeed, one misguided civil affairs officer did take the matter into his own hands, arbitrarily raising the wheat price in his area, thus bringing immediate demands from farmers in other areas.

**ALLIED MILITARY GOVERNMENT ORGANIZATION IN SICILY**


COMMAND CHANNELS INDICATED IN SOLID LINES
CHANNELS OF TECHNICAL COMMUNICATIONS INDICATED IN DOTTED LINES.
ALLIED FORCE HEADQUARTERS
MILITARY GOVERNMENT SECTION (SPECIAL STAFF)
15th ARMY GROUP COMMANDER
CHIEF CIVIL AFFAIRS OFFICER
SPECIAL DIVISIONS PLANNING & TRAINING
ARMY COMMANDER
SENIOR CIVIL AFFAIRS OFFICER
POOL OF CIVIL AFFAIRS OFFICERS AND SPECIAL DIVISIONS
CORPS COMMANDER
SENIOR CIVIL AFFAIRS OFFICER
POOL OF CIVIL AFFAIRS OFFICERS
DIVISION COMMANDER
CIVIL AFFAIRS OFFICERS
ATTACHED CIVIL AFFAIRS OFFICERS

The Chief Civil Affairs Office notified all subordinates, through AMG channels direct, of a new wheat price policy. This could have been accomplished through military command channels, but would have caused delay and needless waste of time of tactical officers who had no remote interest in the price of wheat.

Financing of governmental budgets, legal problems, custody of enemy and alien property, and similar matters were handled directly through the technical channels.

It was also provided that when an area was reduced, and the civil and tactical conditions permitted, the task force commanders would be relieved of civil responsibility, and control of civil affairs in such an area would pass under General Alexander's order to the Chief Civil Affairs Officer.

At 15th Army Group headquarters and at Seventh and Eighth Army headquarters the AMG staff sections included six special divisions. These were called: legal, financial, civil supply, public safety, public health, and enemy property divisions, and dealt with the problems indicated. Sometimes representatives of these divisions were stationed also at corps headquarters, but not regularly.

The chiefs of these special divisions gave technical advice to all AMG echelons below them, sometimes through the AMG technical channels, but they were not barred from visiting or corresponding on technical subjects with representatives of corresponding special divisions, or even directly with civil affairs officers in towns in the field of operations.

At all times, before and during operations, there was closest liaison and cooperation between AMG staff officers and other sections of the general and special staffs. The public health officers cleared their information and plans through the surgeon; supply officers worked intimately with the G-4 section. Civilian supply was one of AMG's heaviest problems, and it was provided that these supplies would be stockpiled, called forward, and handled in Sicily independently of military supplies. At the same time, AMG had a responsibility to help army quartermasters in procuring locally fresh vegetables and military supplies.

Traffic problems and maintenance of order was planned by the public safety division

with the Provost Marshal. At the same time the public safety officer of AMG had to clear with G-2 and CIC the program for arresting dangerous Fascists and assuring the security of the troops and operations.

All of this, and a great deal of other detail, had to be planned in advance at Chrea, and drastic precautions had to be taken there to protect the secrecy of the operations. Officers in the training school were not advised of the beachhead locations until they embarked. They were not even told that the attack would be in Sicily. All briefing of this nature had to be deferred until sailing days, and since the embarkations were from a dozen different points, there was a natural serious interference with smooth planning.

All officers were given cram courses in the Italian language, and all received lectures and written data dealing with Italy in general. Toward D-day the chiefs of the special divisions gave specific instructions to the officers on the handling of their particular problems, but still they were under the handicaps of secrecy. Eventually the complete instructions were drawn up and mimeographed for distribution to the officers, but many of them were at remote embarkation points by this time and did not receive the detailed instructions until after they had reached Sicily. This was an unavoidable circumstance unless the stringency of security regulations was to be relaxed.

Lieutenant Colonel Charles Poletti was assigned as Senior Civil Affairs Officer on the staff of General Patton, and Group Captain C. B. Benson of the Royal Air Force was posted in a similar capacity to General Montgomery. Poletti had a British assistant, Lieutenant Colonel Peter Rodd, and Benson's assistant was an American, Lieutenant Colonel Harvey Gerry, who had served previously with the Eighth Army in Tunisia in a civil affairs capacity. There were fifty-four AMG officers assigned to the Seventh Army staff, and 103 to Montgomery's staff. Later reserves were sent as needed to both armies.

About a month before D-day, Lieutenant Colonel Poletti and Group Captain Benson and certain of their assistants were attached to the armies and became acquainted with the staffs. Orders and memoranda explaining this new civil affairs staff function to the other staff sections were prepared and circulated. The chiefs of the special AMG divisions were introduced to the staff officers with whom their duties coincided, and thereafter there was close planning cooperation.

Under the AMG plan, certain civilian utilities were not initially taken over by AMG, but were controlled by other army staff sections. All telephone, telegraph, cable, and radio facilities were taken over by the signal officer. Power and gas, water supply, roads and bridges, railroads, and wharfs and docks were the initial responsibility of the engineer officers.

However, at all times AMG engineer officers worked cooperatively with the signal and engineer officers, making contacts with civilian officials and ensuring that all possible assistance was given by the civilian and governmental agencies. When the military interest in utilities passed, AMG assumed full control over them.

As D-day drew near, groups of AMG officers were attached to combat units for the purpose of accompanying them in the invasion.

Supplies of all proclamations and orders were carried by each group, so that they would be available for posting immediately upon landing in Sicily. The first seven proclamations dealt with the following matters:

*1.* Announcement of occupation, and the establishment of military government.

*2.* Establishing various offenses as crimes.

*3.* Establishing Allied Military Courts.

*4.* Providing for currency and fixing rates of exchange.

*5.* Closing of banks and establishing a moratorium with respect to certain debts and claims.

*6.* Annuling certain laws, including those directed against the Allied Governments or their nationals or involving racial discrimination.

*7.* Providing for Custodian of Allied and Enemy Property.

Two notices were also included for posting,

one a notice as to the civilian curfew hours (sunset to sunrise) and the other calling for the surrender of arms, ammunition, weapons, and radio transmitters.

Three American divisions, the 1st, 3d, and 45th, landed in Sicily on D-day, and each force brought AMG officers ashore. Lieutenant Colonel Poletti, crossing from Africa with Advance Headquarters, Seventh Army, also landed on D-day and thenceforth acted in coordinating the work of all AMG groups with the several American divisions.

CANICATTI CITIZENS READING AMG PROCLAMATIONS. (SIGNAL CORPS PHOTO.)

The problems that immediately confronted the AMG officers upon landing were similar in all cases in the Sicilian invasion. The case of the 1st Division affords a typical example.

Lieutenant Colonel W. R. Irish left Chrea and joined the 1st Division at Sidi Chami on 21 June, and was attached to the staff section of Colonel Kilroe, Judge Advocate. A few days later nine additional AMG officers, trained as CAO's and CAPO's, joined the division. Colonel Irish and his staff consulted constantly with other divisional staff officers and made detailed plans for operations. A directive on civil affairs was prepared and issued by the Commanding General through the Chief of Staff.

An official report of the first actions by Lieutenant Colonel Irish and his staff provides the following interesting story of their adventures:

"Lieutenant Colonel Irish and Lieutenant Asquini (an Italian-speaking American officer) landed on the beach at Gela at 7 a. m. on D-day under shell fire and proceeded to divisional headquarters about three-quarters of a mile from the beach. At 2 p. m. he started for Gela in a jeep, entering the town about 3 p. m. Considerable fighting was still going on in parts of the town and outside it, including a tank battle. He located himself in a building on the occupied side of the town and called the acting Sindaco, the communal treasurer and communal engineer and the local representatives of the Church together. Three times that day they attempted to hold a conference. Each time they were interrupted by an air raid. Fighting continued throughout the day and for two days thereafter.

"The Italian officials, in spite of the diffi-

culties, were cooperative but were thoroughly paralyzed by events and were unable to render much assistance.

"The chief problems with which Irish was faced in the first few days were as follows:

"*a.* There were 170 corpses to be buried, most of which were already covered by rubble. They had to be dug loose. The populace refused to handle the bodies. Therefore he used Italian prisoners of war and local donkey carts. There were no medical supplies and poor medical care for those suffering from tuberculosis, typhoid, and scabies, which diseases were prevalent in the area.

"*b.* There was no water in the town, because the pipes had been tampered with both by civilians and military personnel. Irish got the communal engineer to work and in thirty-six hours the pipes were again operating.

"*c.* There was no power, because the generating plant was put completely out of operation by bombing. With the exception of the electric plant, the town had not been seriously damaged by air attack. The electric power situation continued to be unsatisfactory for some time.

"*d.* Bakeries were all shut down. These had to be started up with wood taken from bombed houses. This was done on D plus 1.

"*e.* Gela was used as the main artery for bringing supplies in to the troops. This situation necessarily complicated the problem of restoring the normal life of the town.

"On D plus 1, Colonel Irish organized the Carabinieri.

"The Sindaco of the town, a prominent Fascist, had fled three days before the occupation and a school teacher with no experience had taken his place. Colonel Irish was forced to remove the school teacher and to secure a more competent official.

"He was flooded with small individual cases of extreme need and with a refugee problem. Here as in other cases the military called upon civil affairs officers for many things which they were not set up to handle through regular military channels.

"From the beginning he put it squarely up to the Italian officials that it was their job to take hold and to attend to all matters needing attention. They were to call on him for help only when it was absolutely necessary. The looting problem and the food problem were not acute because he entered the town in time to seize the food stores and to organize the Carabinieri to prevent looting."

Lieutenant Colonel George H. McCaffrey and another group of AMG officers reported for duty with the 3d Infantry Division, then assembling in an olive grove near Bizerte. This division was to establish a beachhead near Licata, with the opening assault to be made by an infantry regiment. In order to have an officer in Licata without delay, an AMG major, R. Ashworth, was attached to that regiment and he entered Licata within an hour after it fell.

Colonel McCaffrey and other officers went ashore at Licata later in the same day. Major Ashworth had already established headquarters at the Municipio (city hall) and had organized the Carabinieri. Proclamations and orders had been posted.

The Podesta (mayor) of the town had fled with other leading officials. The remaining officials were summoned to a conference with Colonel McCaffrey, and the clergy was prevailed upon to give strong sermons urging compliance with Allied proclamations and orders.

Mine and shell holes in the city streets constituted a menace to military traffic, and civilian labor was summoned to make repairs. There was little food available, causing uneasiness among the people. The water supply had been wrecked by bombs, and at first water was carried into the town in carts, but this method soon ceased to operate because horses and carts all were requisitioned by the army.

Other towns were taken on the second day, and looting was prevalent in most of them. The looting of grain by civilians was especially harmful, aggravating as it did the already difficult problem of feeding the people. Certain looters were caught and on 13 July Colonel McCaffrey presided over the first Allied Military Court in Sicily, trying three men charged with looting.

The shortage of food in Canicatti resulted in a riot which was quelled with great diffi-

culty by fourteen MP's on duty in the town. They had first fired over the heads of the disorderly mob and when they lowered their fire the mob lay down in the streets and continued to scream.

Colonel McCaffrey reported the situation to the Chief of Staff of the 3d Division, who instructed him to shoot looters caught in the act, if necessary, to reestablish order, and to call upon Colonel Johnson, commander of the infantry regiment, for assistance. A platoon of infantry was sent by Colonel Johnson, and set upon the task of collecting all arms and ammunition seized in the town. At this point Colonel McCaffrey arrested a number of looters caught in the act of carrying away soap. Observing others with similar bundles, he called upon them to stop, but they continued on, and Colonel McCaffrey fired over their heads. In following the looters, Colonel McCaffrey came upon a soap factory outside of which there was a large crowd obviously looting the place. Colonel McCaffrey, with the aid of the troops, finally stopped the looting and rounded up the looters.

Apart from the widespread looting, however, the populace was docile, even if complaining. Government officials, purged of Fascists, were called upon to assume their responsibilities, under general supervision of the military government officers.

AN AMERICAN AMG OFFICER, AND A BRITISH OFFICER ALSO WITH AMG, READING AN AMG PROCLAMATION TO OFFICERS OF THE CARBINIERI AND CITY AND CHURCH OFFICIALS AT ST. AGATA, SICILY, IMMEDIATELY AFTER THE ALLIED FORCES OCCUPIED THE TOWN, 13 AUGUST 1943. (SIGNAL CORPS PHOTO.)

When Palermo fell on 22 July, Colonel Poletti established AMG headquarters there at the Prefetura, and placed the operation of civil affairs on a provincial control basis. All officers still functioned under task force commanders, but provincial boundaries were recognized for purposes of administration, with senior officers being assigned to take charge of each province.

The arrest of criminals and dangerous Fascists was a responsibility of the Counter

Intelligence Corps and its British counterpart, Field Security Service. Removal of Fascists from office was an AMG task, carried out at first by CAO's on the spot, but later organized on an island-wide basis with questionnaires circulated to all public officials, including school teachers, dealing with their membership and activities in the Fascist party, with special committees set up to weed out the objectionable Fascists. It was obvious that AMG could not automatically sweep out all Fascist members from public office, since this would have eliminated practically all officials, including minor officials and clerks who had joined the party only to obtain and hold their jobs. To have fired all Fascists would have produced complete chaos.

When the combat forces moved eastward and took Messina, the entire island was in Allied hands, and the task of AMG shifted from the emphasis on military considerations to those of rebuilding shattered towns, obtaining food and medical supplies, reestablishing essential services, and bringing about a resumption of judicial and other government activities.

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## Some Advice for Officers

An extract from *Management of the American Soldier* by Major General David C. Shanks, U.S.A., (first published, 1918; reprinted, 1942).

THE value of any officer to the Government depends in large part upon how much attention he gives to duty. It is not how much ability an officer has but how well he uses what he does have that determines his value to the Government.

The officer who wants to succeed must be loyal to those above him. He is then on solid ground for expecting it from those below him.

It is the duty of the officer to prove his title and his worth by exhibiting superior knowledge. No organization will long respect an officer who has not the knowledge properly to instruct his men.

If any company officer cannot call every man of his company by name he should get busy at once.

Train the lieutenants and the sergeants to have an interest in company administration by supervising details. When anything goes wrong call in the sergeants and the corporals whose place it was to see about it. If Private Smith has grease spots on his coat and long hair at inspection, see why Corporal Jones and Sergeant Brown had not attended to those details.

Put responsibility for the squad squarely upon the shoulders of the corporal of the squad. Make him look after every detail—instruction, equipment, dress, neatness, general appearance, behavior.

Listen attentively to suggestions of subordinates. Invite recommendations for improvements. This is a good way to create and maintain the interest of subordinates.

Encourage initiative on the part of subordinates. Do this by appropriating or assigning work. Let them do the work under your own supervision.

Justice and promptness are the foundations of military discipline and military efficiency. It takes a level headed man to maintain discipline and yet have every man feel that he has had a square deal.

There is something to be done; the *efficient officer* sets to work earnestly and loyally to do it, overcoming obstacles as he goes along; the *inefficient officer* either does nothing, or spends his time discussing difficulties or in suggesting some other plan more to his liking.

# The Liaison Officer—Past, Present, and Future

MAJOR GEORGE P. WINTON, JR., *Field Artillery*
Instructor, Command and General Staff School

LIAISON has been defined as "a condition such that two or more persons, through the flow of information, are mutually cognizant of each other's situation or intentions." This condition is desirable in any activity in which coordination is sought, and is absolutely essential to effective military operations. In the Army it is achieved by two basic methods—signal communications and the exchange of representatives known as liaison officers.

Let us examine the employment and responsibilities of these officers—what they have done in the past, what they are doing today, and thus what we can logically expect to see them doing tomorrow.

In the Eighteenth Century and earlier, liaison on the battlefield was comparatively simple. The entire battlefield and all the troops on it could usually be seen from one spot, so the commander knew where his units were and what they were doing. Orders were transmitted by mounted messenger or, in the lower echelons, by drum and bugle. Good discipline was sufficient assurance of satisfactory control in combat.

With Napoleon all that changed. The battlefield got bigger and bigger. The units got farther and farther away from the commander, who began to find control more and more of a problem. Toward the middle of the Nineteenth Century the discretionary order came into vogue. Perhaps Lee was its greatest exponent—"do so-and-so *if practicable*." Lee has been severely criticized for using this form, but it was probably better than arbitrary decisions based on inadequate knowledge would have been. The big disadvantage was that the commander didn't know for a long time whether his subordinate had decided it was "practicable" or not. In the Franco-Prussian War, Moltke likewise used an extremely decentralized command system. He had good subordinates and the system worked.

For the next forty years armies continued to get bigger, but modern science was beginning to catch up by providing better signal means. When the first World War broke out, Joffre, commanding the French Armies, determined to retain centralized control. He was responsible; *he* would make the big decisions although his command was to be employed on a front extending from Switzerland to the North Sea. He realized that, while modern signal equipment would enable him to receive information and send out orders, some better means must be found if he wanted to exercise close supervision. He therefore employed the famous "vertical liaison" system. This consisted of a group of carefully chosen young captains and field officers who were attached to the operations section of his headquarters. Their duty was to visit subordinate units, sometimes to carry instructions but more often to inspect and check on the execution of Joffre's orders. Upon their return from these visits, they reported in person to the commander in chief. Being young, agile, and numerous, they could go where he could not, and were, in fact, his eyes and ears. From them he would learn not only the latest dispositions but also many intangible items such as the nervous condition of the lower commanders, etc., which would certainly never reach him through normal channels.

This system was not used by the British or Germans because they felt that such close supervision unduly limited initiative in the lower echelons. Also, it frequently resulted in a lower commander's appearing subordinate to some captain or major from GHQ. In spite of these disadvantages the French stuck to the system and, as one liaison officer has written, it was "perhaps the only institution that survived the war without modification." It undeniably did give the commander in chief a picture of the tone and temper of each of his units which he could never have gathered by any other means during the early, fast moving part of the war.

As the war went into its long stabilized phase, lengthy and detailed orders became the rule. Lower commanders were given com-

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paratively little initiative in any event, and the vertical liaison system continued to show its worth by promoting complete understanding up and down the line. Even in case of friction it had merit, because fundamental differences between the views of higher and lower echelons, instead of being glossed over, were dragged out into the open and settled.

It can be seen that the French vertical liaison system was designed primarily to enforce the execution of detailed instructions. For that purpose it served excellently. The normal purpose of a liaison system, however, is to promote the interchange of information. The French system was not ideally suited for this because of the wide powers of the GHQ liaison officers. Many commanders were relieved because of their adverse reports. This naturally caused them to be distrusted and in many cases cordially hated by the lower echelons. The lower staffs tended to "freeze up" when the GHQ man arrived, just as anyone will when he knows he is about to undergo a critical inspection. The other major armies employed liaison officers to some extent, especially in the infantry-artillery team, but they were not the "super-checker-uppers" of the French system—they simply kept information flowing. In effect, they supplemented the normal channels of communication by personal contact.

Having briefly covered the liaison officer of the past, let us look at what he is doing today.

The system in force in our Army at present is concisely described in paragraphs 47-55 of FM 101-5. The only liaison definitely required is that set up by field artillery with its supported infantry. Many other liaisons, however, are authorized to be used when desirable—including the old French vertical liaison. This has been modified so as to eliminate the most unpopular feature, as will be shown. It is established when ordered by the higher headquarters. Liaison between adjacent units may be directed by a higher commander or may be established on the initiative of the adjacent commanders themselves.

The usual purposes of liaison from higher to subordinate headquarters are given as: obtaining information, transmitting orders, clarifying the existing situation and orders, and receiving and transmitting requests for assistance. No mention is made of inspection or of enforcing the literal execution of detailed orders. Furthermore, the liaison officer is required by the Field Manual to *state his mission* to the commander of the headquarters to which he is sent as soon as he arrives, and to "advise the visited unit commander of the contents of reports to be sent to his own headquarters." This makes it clear that the liaison officer is not to be sent out for the purpose of deciding whether General "A" needs to be relieved. Thus, the feature that made the French liaison officer of World War I such an unpopular gentleman is not a part of our system.

Liaison officers are widely used throughout the Army today. Everybody sends them out in all directions. Yet the resultant liaison is sometimes a bit disappointing. Is our system faulty? No. The system is all right but our application of it is not always as good as it might be.

In the first place, it is a difficult post to fill properly. The work frequently has unpleasant aspects, because the liaison officer is nobody's child. He is always working with strangers. A most important part of his duty is interpreting the viewpoint of one commander to another, which means he must on occasion "stand up to both sides and defend the views of one to the other and vice versa." To one side he is always the outsider, to the other he always seems to be taking the part of the outsider. As General Spears says, in his *Liaison 1914*, "This is a difficult task, in which one generally gets more kick than halfpence." Such an exacting billet is not easy to fill properly. Occasionally, commanders make the mistake of assigning relatively incompetent officers to this duty. When this is done, of course good liaison is not to be expected.

Another obstacle to good liaison is the ineffective way that the officers are sometimes handled. Let's look at the sending headquarters first. The book states that the commander will:

*1.* Give the liaison officer definite and de-

tailed instructions, in writing if appropriate, as to the liaison mission.

*2.* Inform the liaison officer of the commander's plans, especially as they affect the unit to which he is to be sent.

*3.* Insure that adequate facilities are available for communication (signal and transportation means) between the liaison officer and the sending headquarters.

As a matter of fact, at least one of these points, if not all three of them, is frequently neglected.

Skipping over to the receiving headquarters, we find that the book directs the commander to:

*1.* Give the liaison officer all assistance possible, compatible with the normal operations of the headquarters.

*2.* Keep the liaison officer informed as to the plans for future employment of the unit visited.

*3.* Give the liaison officer free access to those staff sections or troops having data pertinent to the liaison mission.

Here the gap between theory and practice is sometimes even wider. Ask any liaison officer. In some headquarters, instead of finding "free access" to the staff sections, he is actually more likely to find himself greeted with hostile glares if he ventures to examine a situation map. Sometimes he will find a tape stretched around a map for the avowed purpose of keeping him and other pests at a distance. In other headquarters he will find that he and all other liaison officers are confined to a certain portion of the command post area, and left severely alone.

Since our liaison officer is often new at the game and is not always properly handled by either sending or receiving headquarters, he can not always be expected to carry out all the difficult and important tasks assigned him by FM 101-5. Frequently, he does not. His procedure on arriving at the visited unit command post is too often to deliver his order, request, or report as the case may be, seek out a comfortable spot, and relax. When he follows this procedure, liaison has degenerated into a messenger service—nothing more. True, the liaison officer nearly always has a definite mission which he must perform. But he always has an implied mission. In the words of Lieutenant Colonel Bellah's article in a recent issue of the *Infantry Journal*, he should be "a walking, living, talking situation map kept up to the minute—by himself." This implied mission will frequently require more effort and ingenuity than his assigned one, but only by carrying it out can he be a real liaison officer.

To sum up—today's liaison system as set forth in our official manuals aims at promoting cooperation and coordination of effort. It *supplements* signal communications by personal contact. It is a sound system. If we sometimes have poor liaison, it is caused by imperfect application of this system.

Now let us speculate as to what the future holds for the liaison officer. In the first place, it seems that he will be more important than ever before. Our forces today operate rapidly over great distances, which makes intercommunication most difficult; yet, when the battle is joined, we need coordination of a high order. It is obviously not going to be feasible to distribute lengthy and detailed field orders very often. The time needed to prepare and distribute them will seldom be available, but even when it is, another consideration will probably prohibit their use: preparation of a detailed order requires detailed knowledge of the situation of the lower units. In tomorrow's war, moving rapidly over vast distances, such detailed knowledge will not usually be available.

The solution, of course, is in many cases to use very brief orders which do little more than outline the mission of the lower unit, leaving the "how" and part of the "what, when, and where" up to the recipient. This solution is an incomplete one, though, because we cannot entirely ignore the "if." Higher commanders will not always be able to wait for complete information before making their will known. It will be necessary for the lower commanders to understand completely the "big picture" and the plans of the high command. When a commander is told to take a certain position, for example, and is told nothing more, the implication is that he is to

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keep trying to take it until his men can't fight any more. The higher commander, however, may not want the position badly enough to expend the unit in exchange for it. The decision to take it may have been based on inadequate knowledge of the enemy dispositions. Perhaps the higher commander really meant to take it "if practicable." The lower commander actually needs to know how important the position is to the general plan. Here is where a high-caliber liaison officer, thoroughly familiar with the "big picture" and possessing the confidence of both sending and receiving headquarters, is able to act effectively by interpreting the order. Granted that such situations should not be allowed to occur, the probability is that they will occur and that the spirit, if not the form, of Lee's "do so-and-so if practicable" will come back.

A thorough grasp of the situation by all concerned has always been recognized as essential. In the past it has frequently been sought by calling the lower commanders together for issue of orders and discussion of plans. Today this practice is being vigorously condemned by our fighting troops from the Solomons to Italy because of the delay involved and the loss of "touch" on the part of the commanders thus pulled back from their units. Tomorrow, it seems safe to say, it will seldom be used in open war by troops actually in combat. Besides, the "big picture" acquired at such a conference becomes out of date as soon as a major change in plan or situation takes place. The answer is *liaison officers*. One might suppose that our modern communications, if properly used, would suffice to keep everyone up-to-date. As a matter of fact, our communications (even when they are all working) are strained to the limit by simply transmitting the minimum of ultra-brief orders and reports. Besides, most staff officers, like all other officers, are preoccupied with doing their jobs and don't take too much interest in keeping some other headquarters informed of all changes.

The need for supplementing normal communications for liaison purposes is shown by the set-up employed in one of our most experienced combat divisions now in the Mediterranean area. The division has eight liaison teams, each consisting of two officers, two drivers, and a radio operator, with two jeeps and complete equipment, including rations. These teams, which were personally trained by the division commander, are sent to adjacent divisions, to corps, and to the three combat teams or regiments of the division. They work in their own radio net with their 193 sets and report all changes in the situation. These reports of changes are plotted on G-3's map, and copies are promptly sent to the other staff sections concerned. The importance attached to liaison by this division (again, it is one of our most experienced) gives a hint as to the future importance of liaison officers in general.

In addition to supplementing normal communications as indicated above, the liaison officer will on many occasions have to *replace* them. When signal communications fail to work, or when the exact location of some unit is unknown, the only way to get orders or requests through may be to send them by an officer. This officer is much more than a courier delivering a message from one command post to another. He is (or should be) thoroughly conversant with the situation, ready to help the recipient by interpreting the order and furnishing additional details needed and in some cases is charged with supervising its execution. In any case, it is his responsibility to see that it is thoroughly understood. In the words of a recent report from the Russian Army, "If the combat order is not thoroughly understood, if mistakes creep into the instructions issued by lower commanders, he may not ever remain as a disinterested spectator. It is his duty to inform his commander fully and with all truth on the situation as it actually exists, and make timely reports of the mistakes made in decisions. This will enable the commander to take speedy action to rectify his subordinate's errors, in order to prevent the disruption of the general plan of action."

Obviously, if the liaison officer of tomorrow is going to bear all this responsibility successfully he must be an exceptionally able man. Many officers are selected for the duty

at present because they are "good mixers"—that is, they get along with strangers easily. This quality is certainly important. A man who is shy or reserved will have difficulty in getting the information he needs and may feel hesitant about informing other people of what he knows. Some self-assurance is absolutely necessary. On the other hand, this assurance must be tempered with tact—otherwise instead of liaison we will get nothing but extra friction. Both of these qualities are secondary, however, to professional competence. The liaison officer must have a solid grounding in the tactics of higher units. His duties require him to deliver and interpret orders and explain complex situations to his commander. Personal courage will be needed as never before. Take the case of Senior Lieutenant Zhemchuzhnikov. This Russian liaison officer made his way *through* the front line to a unit which had wedged itself deep in the enemy position—a sort of "Lost Battalion." He clarified the situation of that unit, informed its commander of the general situation, and brought back with him (again through the enemy lines) reconnaissance information of the greatest value. Any officer who performs in this manner, even though not endowed with a radiant personality, will promptly gain the confidence of all concerned and be able to maintain effective liaison, while a "good fellow" who is nothing more will soon be discredited in combat.

If we agree that tomorrow's liaison officer will have higher responsibilities than before, what are we to do about it today? The first problem, naturally, is to get suitable personnel assigned to the duty. Capable younger officers should be impressed with its personal advantages. After all, it has many, provided liaison officers are used properly. It does provide excellent professional training, in that the liaison officer is constantly working with the "big picture" and has unrivaled opportunity for seeing high commanders and staffs in action. Unlike many "fancy" jobs, it frequently entails personal participation in combat. A good example is furnished by the experience of Major Yenchapin, another Russian liaison officer. He was sent to the front line in an airplane, and upon landing near a village was fired on by German automatic weapons. This fire damaged the plane's engine and made it impossible to take off, whereupon Yenchapin opened up with the plane's machine gun, killing some of the enemy and pinning the others to the ground. He then cleared a path with hand grenades and delivered his information to the headquarters that needed it.

It is, or should be, a most responsible post, because major decisions will often depend upon accurate knowledge obtained and delivered by the liaison officer alone. Like any dangerous and responsible duty, it carries with it many chances for distinction, and should therefore be sought by capable officers.

When the advantages and importance of liaison duty are understood by all concerned, we will begin to secure top-flight liaison officers, and our problem will be half solved. The other half of the solution consists in employing these competent officers to best advantage. No better guide is needed than paragraphs 47-55 of Field Manual 101-5. We have only to carry out the letter and the spirit of these provisions. This *must* start at the top. The commanding general himself must make sure that all his liaison officers know not only the current situation, but also his plans and intentions. To hide his plans from these officers in the name of secrecy is voluntarily to cloak our side in the fog of war. Once our commanding generals become "liaison-minded," the staffs and lower commanders will rapidly follow suit, of course. Then, if we have succeeded in getting good officers for liaison duty, we will have good liaison. Tomorrow's war will demand it.

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# One Way is Through Alaska

Digested at the Command and General Staff School from an article by Commander H. B. Hutchinson, *U. S. Navy*, in *United States Naval Institute Proceedings* January 1944.

OUR forces in Alaska had two enemies to fight; and as was proved by the laborious eviction of the Nips from Attu and Kiska, not the least of these was weather. Now that the Aleutian campaign is over it might be valuable to discuss in a dispassionate manner some of the aspects of weather in the North Pacific theater and how they bear upon future operations. The strategists point out that one of the four approaches to the heart of the Japanese Empire, and the shortest approach of the four, is through the north. The considerable military establishment already existing, the occupation of the new northern bases, and the growing friendly relations with Russia all indicate that Alaska is going to be maintained and quite possibly amplified.

The Alaska Defense Command performed the Herculean task of building fields for the Eleventh Air Force as far west as Umnak, in the Aleutians. All this was done between the time of Pearl Harbor and the Battle of Midway.

Weather was the most outstanding and spectacular subject to be reported in the whole campaign. Weather was strategic. Weather was tactical. Weather was terrible. Weather prevented air support during the initial phases of our invasion of Attu. Weather in the form of all-pervading fog allowed the enemy to evacuate Kiska without detection.

Let us investigate this weather. In the winter it is stormy with the passage of one cyclonic disturbance after another. In the summer it is foggy. For days on end the surface of the sea is covered with the dank pearly blanket of stratus cloud resting at sea level. When is the weather good, if ever? Seldom ever; but the chances are that April and May and October will be better than the other months of the year. Always, however, there are breaks in the weather, winter or summer; and it was during these breaks that the Eleventh Air Force and Fleet Air Wing Four did their glorious work in harassing the enemy.

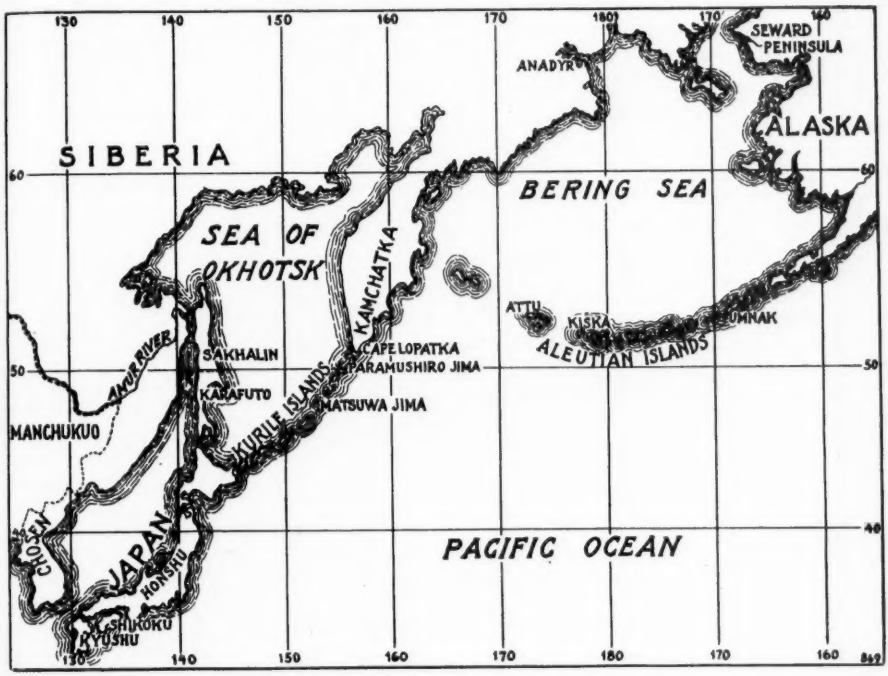
If we are going to advance against the Empire along the northern route, the next stop is very obviously Paramushiro Jima. To accomplish this mission without having air bases in Kamchatka is going to be difficult. Weather in the Kuriles is worse than it is in the Aleutians. Siberia becomes the cold pole of the world during winter. The Sea of Okhotsk becomes ice covered. Even the southern limit of drift ice in the Bering is much lower in latitude against the Kamchatka shore than it is in the body of the sea itself. Attu is in a different climatic province than the more eastern islands of the Aleutians. At the same time, the farther one advances westward and southward the closer one gets to the main stem of warm ocean water, the Kuroshio or Japan Stream. During winter, that area is going to be filled with blinding snow squalls. Aircraft will experience icing, towering cumulus and cumulonimbus clouds, and turbulent air. This will not be favorable for bombing missions from our bases in the Aleutians against enemy bases in the Kuriles. During summer the winds will be warm and humid, and will contribute warm air mass to the Kuriles even more actively than to the Aleutians. The result will be fog even earlier in season than it occurs in the Aleutians. This again is no help to the operation of combat aircraft.

It is reasonable to suppose that the Sea of Okhotsk under the influence of the winter cold of Siberia transported seaward by prevailing winds of northerly and westerly components becomes ice covered down to the fiftieth parallel. Most of the year, however, that sea must be open to navigation from Cape Lopatka to Karafuto.

In general, winter flying conditions over the Sea of Okhotsk, when it is under the influence of the Asiatic anticyclone, must be similar to those over the Bering between Seward Peninsula and Anadyr. These conditions offer no particular hazards to aircraft when the limitations imposed by subzero temperatures are

not disregarded. Bases for such operations must be provided with the facilities for cold weather operation. The technique of cold weather operation already has been perfected by the Army Air Force along the staging route through Canada and at the fields in the interior of Alaska. The summer flying conditions over the Sea of Okhotsk in the vicinity of the Kuriles will be bad. Okhotsk water will be covered by persistent fog banks from Lopatka to Karafuto; the passes between and the Islands of the Kuriles will be blanked out during the greater part of the summer season. Along the coast lines of Siberia under the influence of offshore winds the skies will clear. It is therefore possible, even in summer, that the entire island of Sakhalin will experience periods of excellent flying conditions.

The plot therefore unfolds itself. In order to subject industrial Nippon to routine and consistent bombing we must establish bases within range of Honshu, Shikoku, and Kyushu. Until the Soviets present us with some bases in Kamchatka or in the basin of the Amur River, we must look to Karafuto, the southern end of Sakhalin, as our objective. Paramushiro Jima, Matsuwa Jima, and the rest of the Kuriles must be ruled out for air operations because they are too close to the meteorological battle ground between the warm water of the Pacific, the cold water of the Sea of Okhotsk, and the air masses from the Polar and the Pacific source regions. Karafuto is enemy territory which is ours for the taking. It has both winter and summer climates which offer possibilities for consistent flight operations. It is open to attack, after Paramushiro is ours, through the lower reaches of the Sea of Okhotsk, both winter and summer. Our bombers with fighter escort can operate easily from there against the industrial centers of Japan.



# Mental Conditioning for War

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TWENTY-FIVE years after the Armistice of World War I and two years after Pearl Harbor and Bataan, an "orientation" program of instruction was initiated by the War Department. The objectives of this new orientation activity were announced in WD Circular 291, 20 October 1943—but what is this "orientation"? An abridged dictionary defines orientation as "the faculty possessed by certain birds of finding their way home from long distances." Obviously, this definition is not applicable, so let us analyze the circular.

Circular 291 assigns an "Orientation Officer" in the grade of captain to regiments and equivalent units, in order to accomplish the objectives and intent of Mobilization Regulations 1-10, relating to the responsibility of all commanders for the *morale* or *state of mind* of their command. The Captain "Orientation Officer" is thus charged with assisting his commander in promoting high morale and a healthy state of mind throughout the command.

The desirable qualifications of this Captain "Orientation Officer" are listed as follows:

(1) The Orientation Officer will be selected on the basis of his interest in presenting the justice of the cause for which we fight. He will be well acquainted with the facts concerning the causes, issues, and course of the war.

(2) He will preferably be a college graduate and possess the ability to present his views clearly and convincingly.

(3) Whenever practicable, he will be selected from among the officers already assigned to the unit or organization in which he will serve. Experience as a company commander is especially desirable.

The mission of the orientation program is specific, and is clearly defined as follows:

To create and maintain in every officer and enlisted man a feeling of individual responsibility for participation in the war and to strengthen his efficiency as a soldier by increasing his understanding as to why we fight, keeping him informed as to the course of the war and news of the world, and giving him an opportunity to add to his effectiveness through off-duty individual or group study.

The *duties* of Captain "Orientation Officer" may be broadly summarized as follows:

*1.* He studies *training* conditions affecting *morale* and submits *reports* to his commander through staff channels.

*2.* He conducts the "Army Orientation Course" training program, and obtains through channels orientation "definitions of the military mission" from higher echelons. He assists in orientation instruction by distributing suitable materials, by supervising discussions, by furnishing morale articles for unit and camp newspapers, by arranging for appropriate lectures and motion pictures, by orientation staff conferences, and by similar orientation activities.

*3.* He insures the fullest distribution and use of the "information services and facilities" provided by the War Department, utilizing orientation posters, information films, unit and service newspapers, radio and public address system programs, guide books on service in foreign countries, and similar materials.

*4.* He makes available "off duty time" educational programs, facilities, and instructors. The materials of the United States Armed Forces Institute are made available, including self-teaching and correspondence courses, with high school and college credits. He arranges for regular showing of "GI Movies."

Thus it is seen that Captain "Orientation Officer" will be a very busy regimental staff officer. He makes available training programs suitable for officers and men, covering orientation, information, and general education, and in addition studies morale conditions and submits reports to his commander. He deals through channels, and obtains War Department booklets, pamphlets, posters, war

maps, charts, films, news articles, lecturers, correspondence courses, and other items, for general distribution and with directives for their use. Competing for time is the Special Service Officer, who is principally concerned with providing *recreational* facilities.

To be fully effective, this orientation program must be "sold" to the officers who implement it, who put it into actual operation, who provide the staff coordination, training time, supervising personnel, instructors, housing, and other necessary facilities. These commanders and their staffs in all echelons must be convinced that the orientation program is a vital essential to winning battles or defeating the enemy. They have heard of "morale" building programs before. Most of them helped establish the truth of the doctrine expressed in paragraph 110 of Field Service Regulations:

"Good morale and a sense of unity in a command cannot be improvised; they must be thoroughly planned and systematically promoted. They are born of just and fair treatment, a constant concern for the soldier's welfare, thorough training in basic duties, comradeship among men, and pride in self, organization, and country. The establishment and maintenance of good morale are incumbent upon every commander and are marks of good leadership."

The orientation program seems to be a vital and active expression of "thorough planning and systematical promotion" of good morale. It builds "pride in self, organization, and country." Those commanders who feel that their innate leadership ability will maintain high morale in every officer and man of their units through any eventuality, nevertheless may find their own powers to command made broader and more effective through a close personal study and a wide dissemination of the facilities provided by the orientation program.

A fuller understanding of the importance of and necessity for this orientation program may be inferred from a summary of Section V of WD Circular 290, 1943:

"Owing to the relatively high rate of neuropsychiatric casualties, especially in combat, a neuropsychiatrist is assigned to the staff of the division surgeon. He functions as such. Not only is he to screen out the mentally unfit but he is to make available his professional knowledge for the everyday problems of discipline and morale."

The functions of the division neuropsychiatrist include giving advice on:

*a.* Mental health of the command.

*b.* Early treatment of normal individuals who suffer from minor correctible maladjustments to Army Service.

*c.* Preventive psychiatry, especially in its relationship to discipline and morale, through educational programs and informal discussions with line officers and others who may seek his advice.

*d.* Reclassification procedures to assure the proper assignment of personnel.

*e.* Courts-martial and boards where indicated.

The neuropsychiatrist keeps himself constantly oriented to the changing psychiatric problems during the training, precombat, and combat periods, with a view toward the development of the mental toughness essential to combat troops. He supervises the management of neuropsychiatric casualties during combat. Experience indicates that during combat the neuropsychiatrist functions most effectively at the division clearing station. The avoidance of indiscriminate evacuation and the proper selection for treatment on the spot are his primary functions in the interests of conservation of manpower. It has been shown that when appropriate treatment is administered at the clearing station, more casualties of this type can be returned to duty than when treatment is initiated in rear echelons.

For example, reports from the combat areas indicate that if neuropsychiatric casualties are treated promptly, kept in the division area, and restored to early duty, some 70% to 80% are returned to their units. On the other hand, if these casualties are indiscriminately evacuated from the combat zone, less than 10% are restored to combat duty. Obviously this phase of personnel handling

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or procedure is worth the careful attention of all commanders.

It is most probable that the Captain "Orientation Officer" will confer frequently with the neuropsychiatrist, assistant to the division surgeon, in planning at least that part of the orientation program designed toward "the development of the mental toughness essential to combat troops."

So far this orientation program has been outlined on a staff planning level. The more practical company, battery, squadron, or service organization commander undoubtedly has been building up a list of fundamental questions in his mind. Just what does the company and platoon commander tell his men when they are tired, homesick, worried, or war weary? What should he say when his sergeants want to know what the war is all about and why they are held in Africa or fighting in Italy or New Guinea? How do lieutenants and captains "war-condition" and toughen the minds of the young men so recently hurried from the easy, trusting, adolescent life of our peaceful towns?

Typical answers to such questions are being supplied in various War Department publications, such as the monthly pamphlet "What the Soldier Thinks," and the Medical Corps Technical Bulletin Number 21 dated 15 March 1944. This bulletin outlines a series of three lectures for enlisted men on personal adjustment problems, entitled:

I. Personal Adjustment Problems in the Army.

II. Emotions and Feelings and How to Handle Them.

III. A Healthy Viewpoint Toward Being in the Service.

The first lecture has this introductory paragraph.

"The Army is a hard place in which to get along—harder than back home in civilian life. Some men make the grade, some don't. Doctors see a lot of the men who don't get along; the ones who can't adjust themselves to the Army, the ones who get into trouble, and the ones who develop nervous breakdowns. The purpose of this lecture is to tell what these men run up against and to describe the types of things men find it difficult to cope with in the Army. The reason for doing this is so that men will know what to look out for in the Army and what a man can do to help himself when he encounters one of these problems." The lecture goes on to give a series of basic problems of Army life, why these difficulties exist and what to do about it.

The second lecture tells "how a man reacts when he runs into one of these difficulties, how it affects him physically, and how it affects his feelings and thoughts." For example, "fear" is described as "a natural feeling experienced by anybody in the face of danger." The nature of fear is discussed; its common synonyms are given as "worry, anxiety, terror, panic, being afraid, scared, being frightened, etc." The difference between fear and cowardice is outlined, and a few basic rules are given on "how to handle fear." Similarly are discussed in simple language such thoughts, feelings, or emotions leading to "goldbricking," disciplinary offenses, malingering, anger, resentment, etc.

The third lecture aims at presenting "the four or five main thoughts which, it is believed, will be most helpful to the enlisted man in forming a healthy viewpoint toward being in the service." The topics of the lecture are headed as follows:

1. The Existence of a Job To Be Done.
2. Who Does the Job?
3. The Job Is Tough.
4. Lack of Civilian Understanding.
5. Why Does the Job Have To Be Done?

At the end of the bulletin is found a series of extracts from German and Japanese official statements, definitely threatening the security and freedom of the United States.

These three lectures are offered for presentation by medical officers, preferably with psychiatric training. "It is desirable that the commissioned and noncommissioned officers of the group addressed will be present in the room when the lectures are being given." The bulletin carries the "Distribution: Medical Officers (1)." Captain "Orien-

tation Officer" and the Surgeon should collaborate in arranging for the presentation of these lectures.

This is a different war. It is tough and full of vicious surprises. It will be won only after much "blood, sweat, and tears." It is fought both openly and secretly. It is global in concept, yet some decisions are based on the staying powers and mental conditioning of a few riflemen in remote foxholes on icy hill tops or in jungle swamps. Weapons of terrifying destructive power and incredible cunning are coming into use daily, both in front lines and back along attenuated supply and communications lines. The enlisted man and his officers must be conditioned physically to withstand the rigors of long exposure to heat, cold, hunger, thirst, fatigue, and diseases. They must be trained in tactics and in the professional use of their varied weapons. Equally important are the mental training and preconditioning to withstand the effects of fear which is consciously and systematically induced by the enemy's propaganda and his battle weapons. Mental conditioning is required to withstand the effects af homesickness, worry, and utter boredom sometimes found in inactive or remote battle areas, on monotonous supply tasks, and in uninteresting administrative assignments. A better understanding of the causes and objectives of this war and its progress will help each man to fight or perform his assigned task more effectively. The orientation program offers facilities for such understanding and mental conditioning. It orients men and officers in our just cause and the general progress of the war. It keeps them informed on national and international problems and their implications. For spare time thinking, if any is available, it offers reading, writing, and arithmetic to keep their minds occupied and to increase their general efficiency.

Summarizing, this war is full of disagreeable surprises as to weapons, climate, diseases, living conditions, and job assignments. The building up and sustaining of a high morale through any conditions of success, reverse, or stalemate require the active interest, planning, drive, and will of the leader. High morale will be found in units where discipline is highly developed in both officers and men. Mental toughness, either for combat or for the less exciting but essential administrative and supply jobs, is more readily developed in *disciplined* officers and men. Mental toughness is sustained and increased when every officer and man is intelligently oriented and informed on the control of his feelings and emotions and on the causes, objectives, and progress of the war. Commanders should utilize the applicable agencies of the orientation program as aids in the practical exercise of leadership.

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**A fundamental principle is never to remain completely passive, but to attack the enemy frontally and from the flanks, even while he is attacking us. We should, therefore, defend ourselves on a given front merely to induce the enemy to deploy his forces in an attack on this front. Then we in turn attack with those of our troops which we have kept back. The art of entrenchment . . . shall serve the defender not to defend himself more securely behind a rampart, but to attack the enemy more successfully. This idea should be applied to any passive defense. Such defense is nothing more than a means by which to attack the enemy most advantageously, in a terrain chosen in advance, where we have drawn up our troops and have arranged things to our advantage.**

—Carl von Clausewitz

# An Infantry Observer Adjusts Artillery Fire

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THE adjustment of artillery fire by a forward observer has been so simplified that anyone can do the job with reasonable success, in spite of little or no previous experience. This has been accomplished by the simple expedient of having the artilleryman at the other end of the phone or radio do all the computation, and send all the fire commands to the guns. Hence it is easy for anyone, regardless of branch or grade, to step in and take over the adjustment should the regularly assigned forward observer become a casualty. In the few succeeding paragraphs we offer some suggestions which should be helpful to the inexperienced observer.

Let us suppose that you, the reader, are the inexperienced observer. Your first and imperative need is communication, normally telephone or radio, exceptionally visual or voice. Your first act then is to contact the artillery and report that you are in position and ready to observe. If you have a map, air photo, photomap, or other map substitute, you can report your location (in code, if by radio). For example by telephone: "Forward observer at Crossroad 142J ready to observe. (Authentication as per Signal operations instruction in effect.)" However, bear in mind that throughout this discussion no set phrase is *required* of you at any time.

Next, you simply tell the artillery the location of the target on which you want fire placed and what the target is. This, too, is simple. It might be like this, for instance: "Enemy antitank gun in house at coordinates 43.1-21.6. Will adjust." Or you might say, for the same target: "There's an enemy antitank gun in a house 200 yards southeast of Crossroad 144J. I will adjust your fires on it." The artilleryman will reply with something like this: "Concentration 213, Battalion will fire, Baker, Center range." "Concentration 213" is given you so that you may mark this number in a small circle on your map or map substitute over the target location for future use. The rest of the message means that you will adjust the fire of Battery B, after which the artillery will pour the fire of the whole battalion on the target at the "center" or best range without further effort on your part. (This is what the enemy has called the "automatic American artillery.")

In a few minutes, another message will come down to you to the effect that "Battery has fired." In a space of time which will vary usually between ten and thirty seconds, the rounds should arrive somewhere in the area in front of you. They will usually hit in succession, rounds 1, 2, 3, and 4. Sometimes, to save ammunition, only two rounds will be fired. And also, sometimes to speed the adjustment, the rounds will arrive together instead of in succession. For any of these, your action is the same. You merely report to the artillery where the group of rounds landed with respect to your target. For instance, "200 yards right, 400 yards short." However, here is a suggestion for the first group of rounds you observe. It is better to report what the error is in either range or deflection but not both, in the early stages of your adjustment. For example, report "400 yards short" in this case and omit the "200 yards right." Why? So as to see on the ground what the effect will be in changing the range. Once you have seen two groups of rounds fired at materially different ranges, a line joining them will be in the direction of the guns and hence in the direction of range changes, while a line perpendicular to it will be in the direction of deflection changes. See Figures 1 and 2.

If you sense deflection error only, be sure to add a request to repeat range, e. g., "200 yards right, *repeat range*." In sensings of this type the mention of range is always required.

Figure 1. "400 short."

Figure 2. "200 right, 200 over." Note that these rounds, together with the rounds previ-

ously fired, outline for you on the ground the direction in which your guns lie.

One other important matter. Be bold in initial sensings. If you estimate that the rounds are 200 yards short, report them "400 yards short." Similarly for deflection, if you estimate the rounds to be 100 yards right, sense them "200 yards right." This will result in getting the target between the groups of rounds. This is nothing more nor less than the artilleryman's golden rule "get a bracket." Getting a bracket is most important. It is usually the quickest way to get fire on the target. It prevents creeping towards the target while never quite getting to the target. Also, it enables successive changes to be made smaller and smaller with the certainty that each succeeding change is more and more likely to bring fire on the target.

Now you are ready to go ahead with the rest of the adjustment. The next message is "Battery has fired," and after some seconds you observe the rounds. Assume that you have reported the first group "400 yards short." Then as a result the next group should fall at a range 400 yards greater. To continue, you now sense "200 yards right, 200 yards over." Again you receive the message

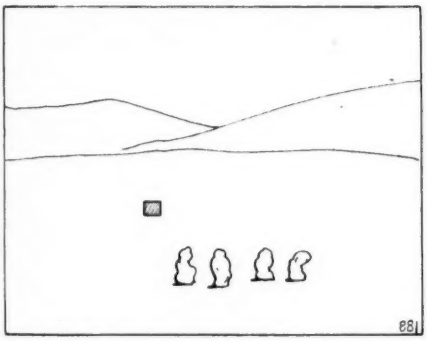



FIGURE 1.

"Battery has fired," and this time you sense the group "50 yards left, 100 yards short." Another "Battery has fired" and your subsequent sensing "50 yards over," or perhaps some rounds fall over and some short in which case you would sense "Range correct." You are now close enough to request fire for effect. Your complete sensing and report then is "50 yards over, fire for effect." A word of caution here. Don't ask for fire for

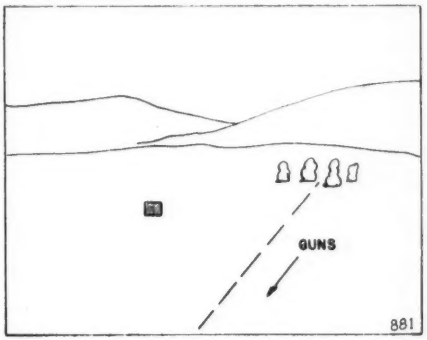



FIGURE 2.

effect unless the fire will certainly fall on the target. Fire for effect disposes of twenty or more rounds of ammunition very quickly, most of which will be fired before you can correct the adjustment further.

The next information from the battalion is "Battalion firing for effect." Each battery will fire several volleys covering the target area 100 to 200 yards in the direction of range and 150 to 200 yards in the direction of deflection. You should, of course, continue to observe the fire and sense the entire mass of fire if it is not centered on the target area. For example, "50 left, 50 short" might be your sensing. In any event, if you have put the enemy sufficiently out of action, you may report the damage done to him or just state "Mission accomplished." If you think additional fire is needed, say "Repeat fire for effect."

To summarize briefly the points so far:

First, contact your artillery and report your position and that you are ready to observe.

Secondly, report the nature and location of any target, stating "Will adjust."

Next, observe the first group of rounds, and sense them with reference to the target for range only, or if you want, for deflection

only. (In the latter case be sure to add "Repeat range.")

Next, continue sensing the groups of rounds as so many yards left or right and so many yards over or short of the target.

Lastly, when firing for effect has begun, observe the fire for possible improvement and to see whether or not the mission is accomplished. Report "Mission accomplished," "Repeat fire for effect," or sense the fire for effect, as appropriate.

Two important types of fire requiring slightly different handling should be mentioned. Both are more effective against personnel in the open or in foxholes than shell bursting on impact which we have been studying so far. The first type is firing high explosive shell with a .15 second delay fuze to obtain "ricochet fire." Such bursts ricochet, bursting about twenty feet in the air, scattering shell fragments over a wide area in a manner about five times as effective as shell with quick fuze. What is different about adjusting it? Very little. You have to add something to the usual sensing only if you observe less than half the rounds bursting in the air. If this occurs, you report "Mine action,* 100 right, 200 short," or for that matter you can say "Too many in the ground, 100 right, 200 over." If you continue to report "mine action" the artillery should inform you that they are changing to quick fuze. But if, on the other hand, you are getting fifty percent or more bursting in the air, you need report nothing more than your deflection and range errors. You will be getting better effect than with the quick fuze.

The second method is time fire. This type is at least equal to ricochet in its effect upon personnel. In adjusting it, however, you need to report the average height of burst in yards, as, for example, "40 yards in air, 400 over." If all burst on impact, say so, or use the artilleryman's expression, "Graze, 400 over." The desired height of burst is twenty yards above the target and, in any event, remember that an air burst more than fifty yards in the air has little or no effect. If some burst in air and some on impact, again say so, or say "Mixed, 400 over." To get your range and deflection sensings, watch for the effect of the shell fragments which hit the ground immediately below the burst. Naturally, a low air burst or an impact burst can be sensed for range and deflection in the usual manner. The additional requirement of sensing the average height of burst makes this type of adjustment a little more difficult, but with a little practice you should get good results.

Now for a few suggestions.

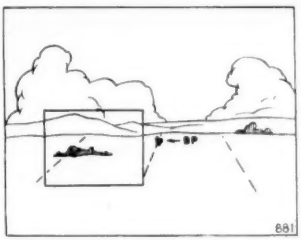
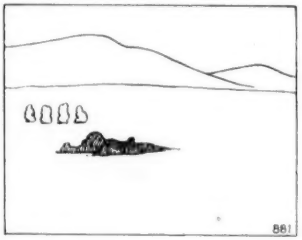
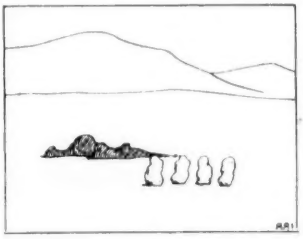
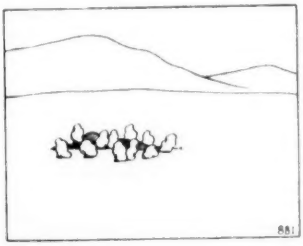
Check with the artillery to see if they have the latest information on the location of our front lines. They will plot such information on their charts, possibly saving you and other friendly troops from being fired upon.

Another thing, suppose you lose some rounds. They have been fired but you see nothing as a result. You can do one of several things. You can "request smoke," "request high air," or you can give an arbitrary sensing of range or deflection which may bring the rounds on to visible ground. If you sense "high air," sense the rounds for range and deflection as if they were on the ground immediately under the point of burst. One other help in difficult circumstances is to find out from a range table, if handy, or from your artillery, the approximate time of flight of the projectile. This is especially important if other artillery is firing in your sector. If you know the time of flight and you get a prompt report of "Battery has fired" you can tell within a few seconds when your projectiles will land. If this doesn't work, you can request smoke or high air.

What can you do if you have no maps or map substitutes? You can still adjust fire, providing you have communication with the artillery. There are two principal ways of starting your adjustment. The first is by a simple geographic description of the target. For example, "Approximately a company of infantry, in the ravine a quarter mile northwest of the summit of Hill 314M. Will adjust." Or possibly, "One thousand yards gen-

* Mine action: rounds not ricocheting but bursting underground.—Editor.

EXAMPLE

| *Messages, sensings, and commands* | *Results* | *Remarks* |
|---|---|---|
| Obsr to Bn:<br>*Base point is 600 right, 300 over, infantry mortars, will adjust.*<br><br>Bn to Obsr:<br>CONCENTRATION 20, BATTERY A. |  | A small group of bushes from which mortars are firing. |
| Bn to Obsr:<br>BATTERY FIRED.<br><br>Obsr to Bn:<br>*100 left, 200 over.* |  | |
| Bn to Obsr:<br>BATTERY FIRED.<br><br>Obsr to Bn:<br>*50 right, 100 short, fire for effect.* |  | Errors reported on initial salvo are now seen to be excessive, but they have given the observer a bracket in deflection and range which enables him to request fire for effect at once. |
| Bn to Obsr:<br>BATTERY A FIRING FOR EFFECT.<br><br>Obsr to Bn:<br>*Repeat fire for effect.*<br><br>Later:<br>*Mission accomplished.* |  | Observer notes that fire is effective. |

erally north along the road between Cassino and Atina, about twelve trucks halted on the road. Will adjust." The second principal method is to ask the artillery to "mark center of sector, high air." Again you will be able to sense the rounds for range and deflection with respect to your new target by using the point on the ground directly beneath the group of bursts. Rounds that burst high in the air are not likely to injure your own troops and are therefore also used when the location of your own front lines is doubtful.

We have already mentioned marking concentration numbers on your map. They, as well as any identifiable terrain features, roads, or works of man, may be used for handy reference points. If, by use of these, you are able to give the location of a target accurate to within fifty yards of its true location, you may ask at once for "fire for effect," without adjusting. Here, again, is an example of "automatic artillery." Typical target designations might be "Concentration 352 is 100 yards left, 100 yards short. Enemy counterattack. Request battalion. Fire for effect." Or, "Road junction 16J, nine medium tanks. Request battalion. Fire for effect."

If you have followed us this far, you have a good basic understanding of how to adjust artillery fire by forward observation methods. However, practice makes perfect. If you can get an artilleryman to give you some "match-box problems," be sure to do so. Also, as you know, in some divisions an artillery officer has been asked to instruct certain officers and noncommissioned officers of the infantry in the technique of adjusting artillery fire, an excellent idea in our opinion.

We furnish you another example, briefly stated, on page 57, and some general data of interest is given below:

GENERAL TYPES OF SHELL AND FUZES WITH CHARACTERISTICS AND USES

(Note: Calibers larger than the 155-mm usually have only one type of shell, high explosive with combination fuze quick and delay.)

| *Type of Shell and Fuze* | *Uses* |
|---|---|
| (1) Shell, high explosive. | General use. See below. |
| (a) With quick fuze. | Bursts mostly above ground. Concussion and slashing effect. Useful against matériel and personnel, but see below for personnel. |
| (b) With delay fuze. | Ricochets and bursts in air or penetrates deeply and explodes. If you are getting at least half ricochets, you will get superior results against personnel in foxholes or above ground. Also useful for penetration such as for dugouts and buildings. |
| (c) With time fuze. | Bursts in air with superior results against personnel in foxholes or above ground. Best height of burst is twenty yards (average). |
| (2) Shell, smoke, base ejection, with time fuze. | Used mainly to blind enemy observation, rarely to locate your own rounds. Throws out canisters of smoke-producing agent which burn effectively from two to three minutes. Adjust on a point *up* wind from enemy observation, with a burst 100 yards or more high to insure air bursts. |
| (3) Shell, chemical, with fuze, quick. | |
| (a) White phosphorus. | Some of this type usually available. Smoke-producing, causes severe burns to personnel, sets fire to inflammable matériel. Not as good as base ejection smoke shell when blinding enemy is the principal mission. Also excellent for locating own rounds. |

| | |
|---|---|
| (b) Gas. | Causes casualties and/or denies use of areas or material objects to both the enemy and friendly troops. Also causes enemy to put on gas mask. |
| (4) Armor-piercing shell with base fuze. | Used against armored vehicles and against steel and concrete works. |

In conclusion, let us repeat that the terminology used in this article in the adjustment of fire is not mandatory. It is authentic except for the addition of the word "yards" in our sensings. There is no need to memorize any of the terms. If, instead of "200 yards left, 400 yards short," you happen to say "500 yards southeast," or if you say "Fire that again," instead of "Repeat range," or, again, if you say "We knocked hell out of five trucks and one got away," instead of "Mission accomplished," you can be sure that it will be all right. Everyone will know that you have learned how to adjust artillery fire.

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## The Sniper

Digested at the Command and General Staff School from an article by Lieutenant J. Boyle in *An Cosantóir* (Eire) February 1944.

EVERY marksman is not a sniper, but every sniper must definitely be a marksman. But there are other qualities which raise him above the standard of the ordinary marksman, and they are:

*1.* He must have expert training in observation and be able to make proper use of all kinds of ground and cover.

*2.* He must be quick to pick out fleeting targets or targets which are exposed for only a very short time.

*3.* Every single shot he fires should mean a casualty.

To be a sniper, a man must be free from any defects in his physical make-up. First in importance is his eyesight—it must be perfect and he must know how to use it. His hearing must also be good, because, when out on his own, he might easily be taken by surprise if he is not alert in every faculty to imminent danger. As he may often find himself in an awkward position when carrying out his mission, be must be able to keep cool and self-reliant. If he is not successful in accomplishing his task at the first attempt, he must keep on trying. To enable him to do this he must be a man of great patience. When we consider the necessity for all these qualities we can easily understand how unsuitable a nervous, highly-strung, restless person would be in the sniper's role.

He must know how to use and maintain his telescopic sights.

He must be able to construct a concealed position for himself, camouflage and loophole it properly, and know how to make it bullet-proof if he is to occupy it for any considerable time.

His "judging distance" must be very accurate, because all the time he is his own "section commander."

He should be good at map-reading and sketching and be able to write accurate messages and reports.

First of all, consult the results obtained by your unit on the range. When you have your "crack shots" selected, consider their suitability from the other angles already mentioned. A good guide when selecting your man is to look up his personal record and see what his civilian occupation was. Farmers, or those used to open country life, will be found to be the most suitable. They are naturally aware of all little details which constitute the countryside, and any alteration in the order of these will immediately be detected by them.

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# The Ubiquitous Mosquito

GROUP CAPTAIN R. H. S. SPAIGHT, *RAF*

*Group Captain R. H. S. Spaight was one of the first entry of regular officers to the Royal Air Force College when it opened in February 1920. Since then he has served continuously with the RAF, graduating from the RAF Staff College in 1932. In the early part of the war he was successively Assistant Director of War Training and Deputy Director of Operational Training. Subsequently, he was posted to the RAF Bomber Command, and came to his present post of Director of Training, USA in the RAF Delegation straight from command of a bomber station.—THE EDITOR.*

THE idea of a light, unarmed bomber which, by its high speed, could evade the fighter defenses has for a long time been an attractive conception. It did not, however, approach realization until in the early days of the war Air Chief Marshal Sir E. R. Ludlow Hewitt—then Commander in Chief of the Royal Air Force Bomber Command—pressed hard for the introduction of such a type. He realized the deficiencies of the early Wellingtons, Whitleys, and Hampdens with which his Command was equipped, and appreciated that their slow speed and low service ceiling with a full bomb load made them almost valueless for the attack by day of fleeting opportunity targets or for pin-prick harassing operations against the German Luftwaffe, which was then at the zenith of its power. Even when the principle of producing such an aircraft had been agreed upon, the difficulty arose of finding the manufacturing capacity to make the aircraft. All firms capable of making the conventional metal-constructed aircraft were already working to full capacity.

Then it was remembered that in 1934 the de Havilland Aircraft Company, Ltd., had constructed three aircraft of a type called the Comet, of wooden construction, to compete in the MacRobertson Trophy race between England and Australia. One of these, flown by C. W. A. Scott and T. Campbell Black, had won the race, flying from Mildenhall, Suffolk, England, to Melbourne, Australia, in seventy-one hours. Another Comet had finished fourth.

The de Havilland Company were approached, and after inspecting the first mock-up made in a suburban house on the outskirts of London, officials of the Air Ministry and the Ministry of Aircraft Production immediately committed themselves to what was considered by some to be a retrograde step in aircraft production, an extensive program for a light, unarmored bomber of wood construction.

Design work on the DH-89 began in December 1939, and within two months the Mosquito was in operational service.

The Mosquito was the first all-wood airplane to go into operational service in this war, and if there were some misgivings at first regarding the ability of this type of construction to stand up to modern gunfire, both from the ground and the air, they have been completely disproved in action. Damage is easy to repair and maintenance problems are simplified. There is no doubt that a wooden structure permits a much finer external finish than can be obtained with metal, and faultless surface finish has its place in the combination of qualities which give the Mosquito its pre-eminence.

At the outset, there were four marks of the Mosquito. The Mark I is the prototype which, from the beginning, showed remarkable promise and needed little modification. The Mark II is the standard fighter version with an armament of four 20-mm cannon and four 0.303-inch machine guns. The Mark III is a dual-control trainer for operational training, and the Mark IV is the standard unarmed day bomber.

The design of the Mosquito was engineered for dispersed manufacture and ease of assembly. The wing is built in one unit and the fuselage in two horizontal halves. All internal wiring and equipment are installed before the halves are joined together and

the fuselage is then dropped onto the wing. The landing gear is of the simplest type, employing rubber blocks in compression for springing. Each unit is retracted hydraulically rearwards into the extensions of the engine nacelles.

The Rolls-Royce Merlin engines are carried on underslung welded steel tube mountings and are enclosed in nacelles which are free of all external excrescences except for the exhaust stubs which, in the night-flying Mosquitoes, are covered by flame-damping shrouds. Coolant and oil radiators are mounted within the thickness of the wing between the nacelles and the fuselage. The air entry is in the leading edge of the wing, with the controllable exit in the under surface just ahead of the front spar. In order to provide room for these cooling arrangements ahead of the spar of the leading-edge of the wing between the nacelles is extended forward nearly two feet. This extension, taken in conjunction with the nearly straight leading-edge of the outer wings and the marked sweep forward of the trailing-edges, is a notable recognition feature.

The prototype Mark I is the only one of the quartet which has engine nacelles which do not protrude aft of the trailing-edge of the wing. All are fitted with Rolls-Royce Merlin 21 engines, and all embody the same basic construction. The Mark II fighter has a solid nose to accommodate the four 0.303-inch machine guns, an armored bulkhead behind these guns and ahead of the cockpit, and a flat bullet-proof windscreen. The battery of four 20-mm cannon is mounted below the pilot's cockpit in what is the forward portion of the bomb bay of the Mark IV, the guns firing through ports in the underside of the nose. The Mark IV bomber has a transparent nose for the navigator-bomb aimer, a Vee unarmored but-headed windscreen, and internal stowage beneath the cockpit and wing for a 2,000-pound load.

The cockpit, over the leading-edge of the wing, seats two in slightly staggered side-by-side seats under a transparent canopy which fairs aft into the fuselage to give a good rearward view. The pilot is seated on the port side and is provided with a two-grip control in the Mark IV bomber version, or a single column with a terminal gun-firing button in the Mark II fighter. In the bomber version, both the pilot's windscreen and the bomb aimer's optically-flat window in the nose are double-layered, and a constant flow of warm air is passed between the layers to prevent freezing or misting. As already mentioned, the fighter version has a flat bullet-proof screen and a solid armored nose. Another cockpit difference between these two models is in the means of entry. The bomber version has a hatch in the underside of the nose, whereas the fighter model is entered through a door on the starboard side because the floor is taken up with the barrels of the four cannon.

It will be apparent from these descriptions that the Mosquito has proved outstandingly successful in a variety of roles. Although it was originally designed for a strictly limited purpose, it has subsequently proved outstandingly successful as a long-range fighter with Coastal Command, a standard night fighter, and also for intruder patrols with the Fighter Command, as a photographic reconnaissance aircraft, where its range has enabled it to obtain photographs of targets which it had not previously been possible to reach, and, finally, in the role originally conceived, with the Bomber Command for both night and day bombing. It is remarkable that this aircraft, which is to be found at the spearhead of the Pathfinder Force with the night bombers, also undertook the first daylight attacks on Berlin in January 1943.

The following is a first-hand account of these two daylight attacks which were made on Berlin on 30 January 1943:

The first attack consisted of three Mosquito aircraft which were to be over the target at 1100 hours, the time at which Field Marshal Goering was scheduled to speak to the German people. The second also consisted of three Mosquito aircraft, to attack at 1600 hours—the time at which Dr. Goebbels was scheduled to broadcast. Since the whole object of these attacks was to hit at the Nazis'

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morale by disorganizing two important public speeches, timing, and therefore navigation, had to be of a high order.

Briefing commenced at 0530 hours on the 30th. Our route gave us a total DR distance of 1,145 miles. From base we were to fly at zero feet in order to get under the enemy's Radar system. From there on to the target we had to climb to 25,000 feet—calculating a point on this leg at which to commence climbing so that we were at the correct height some fifteen minutes before the target.

After bombing, we had two plans: either to descend to 20,000 feet (and use the cloud which we had been told to expect at this height for cover) and remain at this height before descending on the last leg to base, or, should cover be lacking, to descend to zero feet immediately after bombing, and to come home in this manner all the way.

We were airborne at 0847 hours and set course two minutes later at 0849 hours, in open formation echelon starboard. The English coast was crossed at 0900 hours and frequent drifts were taken at low level over the sea using "white caps." This proved to be more difficult than usual owing to bumpy conditions and continuous rain. At 0931 hours we altered course for Makkum at the northernmost tip of the "Causeway" over the Zuider Zee. Our intended landfall was the southern tip of Vlieland, but we actually crossed the islands some two miles south of track at Eierland—on the north tip of Texel —at 0936 hours.

Three minutes later we left the town of Sneek about a mile to our port, and saw the Dutch flag flying from a large building which we took to be the town hall. Map reading at this stage was not easy, due to almost continuous heavy rain, and we were helped considerably in checking up on our track by church spires, etc., which appearing ahead to port and starboard—indicated the presence of towns. At 0959 we crossed the Dutch frontier, which was quite conspicuous with its red and white striped posts and sentry boxes.

From now on, the weather began to improve slowly. We saw no motor traffic on the roads, with the exception of one large, red, singledecker bus, but there were numerous cyclists. On one occasion, when crossing a field where ploughing was in progress, both horses reared violently and overturned the plough and driver; some minutes later another farm laborer, seeing us approaching, went down on his knees in the middle of the field, pulling his hat right down over his ears. We did not fly over any of the towns or villages at low level, but—seeing them coming up ahead—turned gradually round them and back on the track, in order to avoid the odd Bofors or machine-gun posts. The weather was still steadily improving and the rain had almost stopped. At 1022 hours (just north of the town of Niemburg) we altered course for the target and a minute later started to climb steeply to 25,000 feet. The rain had stopped by now and visibility was getting on for twenty-five miles. We were climbing at some 1,500 feet per minute in the initial stage and both Steinhuder Lake and Hanover were clearly visible to starboard. Cloud was entered at 6,000 feet and was not cleared until we reached 13,500 feet at 1033. At 1046 hours, at a height of 25,000 feet and exactly according to pre-flight plan, we levelled out for the final seventy-seven miles.

A careful look-out now had to be kept for the FW 190's, since the nearest cloud was some 14,000 feet below us. A large gap in the cloud ahead of us appeared at 1055 hours and we commenced gentle evasive action. The first thing visible through this gap was the steam and smoke from a train; then a vast built-up area with the lake near Kopenick to the starboard ahead. We had reached the capital of the Third Reich!

At exactly 1100 hours we dropped our bombs in a long stick, with our camera switched on, using the south edge of the city as an aiming point. We had been prepared for a pretty warm reception, but nothing happened until we turned away in a gentle dive, shortly after which we saw several spontaneous bursts of flak away to our starboard and which seemed to be coming from

the northern side of the city. This gave us the impression that all the antiaircraft defenses must have been given a "stand-down" to listen to Goering's speech. A moment or so later we spotted an unidentified aircraft flying on a parallel course beneath us, to starboard and about five miles ahead. We dived to gain cloud cover, but at 20,000 feet the other aircraft was seen to be going in our direction, and was identified as another Mosquito. The cloud tops were about 10,000 feet below us, and at 1110 hours—flying in clear blue sky—we altered course to 296° to make certain of missing the heavy defenses there. The cloud now began to rise ahead of us, and by 1130 we were flying through thin, broken cloud tops at a height of 20,000 feet. At 1155 hours—being certain that Heligoland was well behind us to port—we began to descend slowly. During this descent only very slight icing was experienced. At 1306 we crossed the English coast six miles south of track and, altering course for base, arrived 1318 hours—two minutes later than our estimated time of arrival.

The latest mark of Mosquito, in addition to its normal bombing and photographic roles, can also be employed as an intruder, a fighter-bomber, a long-range fighter or an escort fighter. At this stage it is not practicable to release any of the detailed performance figures for this aircraft, but it is sufficient to say that it is as good, or better than, even the most modern type of single-engined fighter aircraft produced by the enemy.

It is perhaps not going too far to say that this same aircraft, produced more or less as an after-thought from non-critical materials, will, when history comes to be written, prove to be one of the outstanding aircraft of the present war.

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## Friction in War

THE conduct of the war resembles the workings of an intricate machine with tremendous friction, so that combinations which are easily planned on paper can be executed only with great effort.

The free will and the mind of the military commander, therefore, find themselves constantly hampered, and one needs a remarkable strength of mind and soul to overcome this resistance. Many good ideas have perished because of this friction, and we must carry out more simply and moderately what under a more complicated form would have given greater results.

It may be impossible to enumerate exhaustively the causes of this friction; but the main ones are as follows:

*1.* Generally we are not nearly so well acquainted with the position and measures of the enemy as we assume in our plan of operations. The minute we begin carrying out our decision, a thousand doubts arise about the dangers which might develop if we have been seriously mistaken in our plan. A feeling of uneasiness, which often takes hold of a person about to perform something great, will take possession of us, and from this uneasiness to indecision, and from there to half measures, are small, scarcely discernible steps.

*2.* Not only are we uncertain about the strength of the enemy, but in addition rumor (i.e., all the news which we obtained from outposts, through spies, or by accident) exaggerates his size. The majority of people are timid by nature, and that is why they constantly exaggerate danger. All influences on the military leader, therefore, combine to give him a false impression of his opponent's strength, and from this arises a new source of indecision.

We cannot take this uncertainty too seriously, and it is important to be prepared for it from the beginning.

—Carl von Clausewitz

XUM

# Rangers in a Night Operation

CAPTAIN LEILYN M. YOUNG, *Infantry*
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*Captain Young, who went overseas to Northern Ireland with the 34th Infantry Division in February 1942, volunteered for service with a Ranger battalion when that unit was activated in June 1942 in Ulster. After training in Scotland, England, and Northern Ireland, he was with the Rangers who landed as the initial assault wave at Arzew, Algeria, in the African invasion on 8 November 1942, as this unit was part of the Center Task Force. After the French capitulation, he fought in the southern sector of the Tunisian front until the close of the American II Corps' campaign there. Later, leading a company of a Ranger battalion, Captain Young landed on the beach at Gela, Sicily, at H-hour the morning of 10 July 1943. Following the close of the Sicilian campaign, he assisted in planning the Ranger operation at Salerno.—THE EDITOR.*

ACTIVATED in Northern Ireland, trained in Scotland, initiated into battle during the invasion of French North Africa, and held at fighting pitch by maneuvers in Algeria, the Rangers were a finished fighting team.

For nine months they had worked together. After a strenuous month at the British Commando depot, where Commando instructors whipped the Rangers into top physical condition, and five more weeks of amphibious training, the Americans spent many hours in special night training, stressing movement in the dark over difficult terrain. Some of these Rangers were at Dieppe.

The Rangers successfully executed a difficult night landing operation and captured two key French coastal batteries at Arzew, Algeria, in the invasion of Africa. They fought the French until the armistice. Further extensive training in night operations followed this brief period of actual combat.

The Ranger battalion commander contemplated the execution of a series of night raids to fulfil a two-fold mission assigned by the commanding general of the American II Corps. The general had asked the Rangers to execute a number of daring night attacks against widely scattered Italian positions in the Gafsa—El Guettar sector of Tunisia in an effort (1) to further weaken shaky Italian morale and force the Axis African high command to counteract this weakness by assigning German reserves in rear areas to Italian tactical units in the line, thereby reducing the number of German units in reserve; and (2) to so enrage the enemy that he would desert his strongly defended and well-fortified positions in the mountainous areas east of Gafsa and move westward into the desert to fight in open terrain.

Sened Station was selected as the Rangers' initial mission in this new campaign (see Figure 1).

Early one afternoon, from the Ranger bivouac in an olive grove at the edge of Gafsa, the battalion commander, his executive officer, and the commanders of the three assault companies which were to be committed in the Sened action went for a visual reconnaissance of the enemy outpost and to select a mountain hideout for the day preceding the raid.

Returning to Gafsa in the early evening, the battalion commander alerted the three companies and such headquarters personnel as would be required for the operation and at 2300 hours the raiding force moved out to rendezvous with trucks. At 0130 the motor column began to move northeast from Gafsa along the Gafsa—Sidi-bou-Zid road. Twenty-four miles from Gafsa, after a two-hour black-out ride along a road which in daylight was under constant enemy observation and periodic artillery fire, the 200 Rangers detrucked at a tiny French outpost.

From 0400 until first light at about 0600, the Ranger column marched rapidly, covering the slightly more than eight miles from the

French garrison to the predetermined hiding place. There, high up in a mountain valley between three peaks, the raiders rested and slept throughout most of the day, which gained during the day, as the Italians, unaware of close scrutiny, moved about freely from installation to installation, located at various spots on a trio of small hills protect-

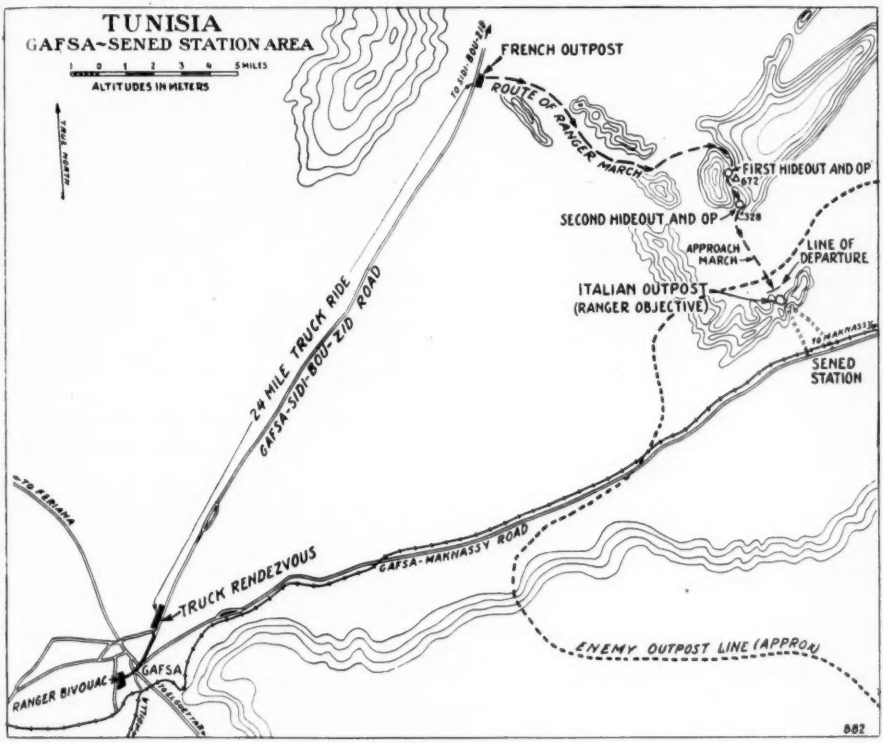


FIGURE 1.

seemed longer because of cold rations and a bitterly cold wind against which the lone shelter-half each man carried was insufficient protection.

During the day each company commander took his two officers, platoon sergeants, and section leaders (in a Ranger battalion squads of eleven men are called sections) to a vantage point from which the Italian outpost, objective of the coming night's raid, was under constant observation.

Much valuable information concerning the exact location of enemy positions and possible routes of approach to the strongpoint was ing a mountain pass to the Maknassy Valley.

An estimate of the strength of the outpost was made by counting the number of enemy who appeared throughout the day. Tabulation of the day's observation of figures on and around the position caused the Italian strength to be estimated at about 100 men. (After the attack the actual strength was set at approximately 130.)

Since the observation post at the hideout was some six miles from the objective and since closer observation was desired, the raiding force moved at 1600 to a point just slightly more than three miles from the Italian out-

post. In the new hideaway, a high mountain ravine shielded from the enemy by one final peak, the Rangers were allowed to speak only in whispers.

Just as the sun was slipping behind the mountain range to the west, final reconnaissance was completed from the new observation post. Plans then were passed down by the battalion commander. In an hour all troops had a complete understanding of the planned raid and all questions had been answered.

After more cold rations the Rangers settled down to wait. Each individual knew his particular job and the complete plan for each company in the operation. All key men had viewed the enemy position during the daylight and were acquainted with the terrain and location with reference to prominent ground features of certain enemy installations considered vital initial objectives for groups as small as half sections.

After a final check of equipment the raiders lay down to rest. Weeks before, all equipment which might rattle during movement and give away surprise had been padded and tied down as ordered by Ranger SOP. The Rangers wore stocking caps but no steel helmets against which rifles might clatter. On the back of each man's pack there was a distinguishing mark which was standard equipment for night operations, its purpose being for the identification of friends at night. The password for the night had been selected. The 200 raiders were ready. Confident, they fell asleep, huddled in groups to gain warmth as a biting wind swept down their ravine.

As the crescent moon slipped slowly toward the mountain heights and the dimly lit desert plain darkened appreciably, the whispered command "On your feet" stirred the 200 from restless sleep. It was 2240. Bayonets were fixed. Minutes later the Ranger column was on the move. The silent men moved down the rock-strewn slope until finally the steep descent ended. Level ground was now the answer to each additional searching footstep. The Rangers had advanced about 1,500 yards and had reached the first check point.

Now about two and a half miles of flat desert, broken only by numerous dry wadies, lay between the raiders and their objective. Silently the head of the column halted so the rear might close up. Immediately the whispered word from the rear was passed forward: "All present."

Then in an approach march formation the Rangers moved again, aiming directly for a predetermined point only 500 yards from the dark and silent Italian outpost where final reorganization and initial deployment would occur.

With dispositions accomplished, the command "Move out" was passed along the line.

Slowly and with infinite pains to prevent even the slightest noise in movement, the Rangers marched forward cautiously. When they had advanced to within 350 yards of the Italians, dogs began to bark in the vicinity. As one man, the 200 Americans hit the ground. The noise from the howling dogs finally ceased, and after a five-minute silence the whispered command "On your feet" renewed the advance.

Minutes passed as the slow-moving formation edged forward. Now the Rangers were within fifty yards of the final check point, which also was the line of departure and was but seventy-five yards from the enemy. Another minute was over; the group halted. After a final, silent check of formation position the line was extended.

During the halt at the line of departure, each company commander maneuvered his organization so that each section would be directly in front of its objective. The basic overall formation remained intact, but intervals between sections were no longer static and determined by sight contact. Intervals in the attacking line now were determined by intervals between objectives on the hills. Each platoon leader was free to alter the intervals and distances of his formation to suit the situation confronting him.

Boundaries between companies (see Figure 2) had been fixed during visual reconnaissance of the enemy position. The left company was to include the left hill and exclude a road along a ravine between the left and center hills on the right. The center unit was to in-

clude this road on the left and to exclude the bottom of a ravine on the right. The right company was to include this ravine on its left and to include a knoll at the extreme right of the right hill.

In the far distance, dogs barked again. Ahead, just seventy-five yards, the Italian outpost still was quiet. With the whispered words "Move out" the attack began. Silently the Rangers edged toward their first objectives.

Surprise was complete. Now only thirty yards separated each flank company from the noiseless Italian positions. Suddenly, from near the center of the attacking line, an excited shout in Italian and a short burst of machine-gun fire split the absolute silence of the night. It was 0100. Undiscovered, the center Ranger company had overrun its objective twenty-five yards before the two flank units hit their enemy installations.

From previous reconnaissance at distances of six and three miles, the enemy position had appeared to be organized on a series of three hills, each equidistant from the line of departure, a trail about seventy-five yards in front of, and parallel to, the line of hills. It was apparent now that actually the center hill jutted forward about twenty-five yards in front of the two flank installations, placing the center of the Italian position closer to the attackers. This fact resulted in a deviation from the original attack plan, since the Rangers had anticipated a simultaneous blow against the three hills. Targets of opportunity for the mortars were a direct result of this minor error in reconnaissance of terrain.

The need for absolute silence having terminated abruptly, Rangers of the two flank companies shouted "Deploy" and the two assault sections of each of the four platoons moved immediately into skirmish lines. Moving forward on the run, they wiped out initial objectives rapidly.

The center force, having been on top of its objective when the Italians finally sounded the alarm, struck sudden, vicious, decisive blows with bayonets, fighting knives, and concussion grenades before the enemy could man any of his defenses in the middle sector. Within five minutes resistance in the center was destroyed. On the flanks the action progressed somewhat differently. Location of the center defense area twenty-five yards forward of the flank positions resulted in a time lag of about twenty seconds which gave the defenders an opportunity to man positions near the rear of the strongpoint. The enemy rushed to his guns, opened uncontrolled fire in all directions, tossed fragmentation grenades indiscriminately, and even began dropping 47-mm shells into the valley which the Rangers had crossed thirty minutes earlier.

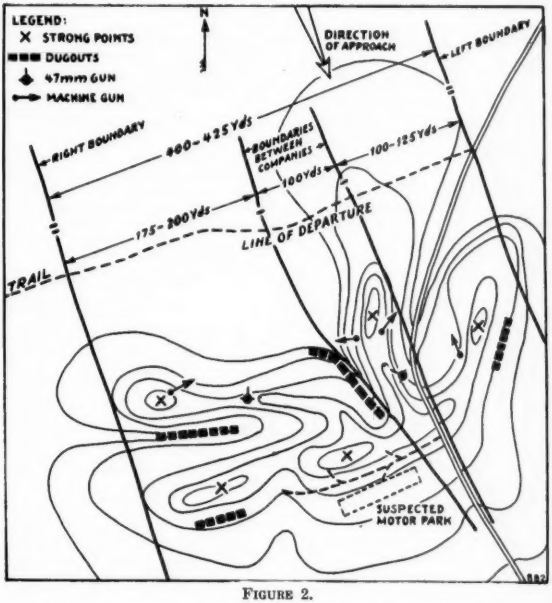


FIGURE 2.

DRAWN FROM MEMORY BY THE AUTHOR, THIS SKETCH APPROXIMATES THE TERRAIN AND SITUATION AT THE ITALIAN OUTPOST.

In pouring a continual hail of fire from their few weapons not silenced as initial raid objectives, the remaining Italians revealed their positions; and completely hidden by the black night, the Rangers crawled and rushed forward to destroy these guns.

Going into position at the first alarm by the Italians, the Rangers' 60-mm mortars opened fire quickly and began dropping shells on an area directly in rear of the outpost hills. This initial mission firing was on an area suspected to be a vehicle park but was superseded quickly by requested fire in compliance with demands from platoon leaders for mortar action against targets of opportunity which generally were enemy machine-gun emplacements spasmodically holding up the advance of certain attacking sections.

When the center company was squeezed out of the assault because its boundary ravine on the right was discovered to swing left and continue at an angle until it crossed the road which was the unit's left boundary, another fault in the basic plan was apparent. From distant observation, the right ravine was selected as a boundary because it appeared to be almost perpendicular to the line of departure and parallel to the direction of attack. Because the ravine boundary failed to continue perpendicular to the line of departure, the center company was unable to reach this strongpoint area near the hill crest.

Usual Ranger practice prescribes that boundaries for night attacks must be definite terrain features, if they exist, and must not be crossed, even though previously assigned objectives are discovered to lie outside these boundaries. This is designed to keep men from moving into areas where friendly fire is or may be put down at any moment. When he discovered his unit had been squeezed out of the assault, the center company commander asked the right company leader if mortar fire could be directed against this area which actually was assigned as a center company objective but lay within the right company's boundaries. After a quick verification of the position of his troops, the right company commander gave the center company's mortars permission to fire inside the area belonging to the right company. A second strongpoint deep in the enemy position also became a target of opportunity since withering cross fire from its automatic weapons pinned down the section assigned to destroy it.

As the flank company assaulting groups advanced toward the crests of the outpost hills, the mortar section leaders leapfrogged their guns forward and selected new firing positions in defilade below a five-foot rock ledge honeycombed with enemy trenches already cleaned out. From these advanced points the mortars gave effective pinpoint fire in support of the assault waves.

Shouting voices issuing orders in English, an occasional call for a "medic," and the cries and moans of wounded and dying Italians were audible during brief lulls in the roar of bursting grenades and mortar shells, the whine of bullets, the chattering of machine guns, and the distinctive barking of tommy guns.

Final mopping up was completed just as the battalion commander issued the order to withdraw. The fight was over. The time was 0120.

Pulling back, the flank companies reorganized, counted wounded and prisoners, and formed for the fourteen-mile march to the French outpost where trucks would be waiting to move the Rangers to Gafsa. Meanwhile, the center company remained in position on the battered Italian outpost to secure these operations. When these were completed, this company, leaving one section to secure the withdrawal, pulled back and joined the waiting column. After those twenty action-packed minutes, the attackers counted among themselves one man dead, one wounded seriously, and fourteen walking casualties, compared to an estimated tabulation against the enemy of eighty-five dead, approximately twenty-five wounded severely and left as dying, about thirteen prisoners, and four or five escapees. As the long trek began, the rear guard section took its place several hundred yards in rear of the main body.

The one dead Ranger was killed by a shell from a 47-mm gun before it was put out of action. The raider, crossing the line of fire of

the 47 only seven or eight feet from the gun muzzle, was hit in the head and died almost instantly. Approximately eighty-five percent of the Ranger casualties were wounded by fragments from grenades which the Italians had tossed in all directions. Accurate, effective mortar fire on the two enemy strongpoints near the crest of the hills probably held down the number of Ranger casualties, since the volume of unaimed fire these positions were throwing would have been extremely dangerous had it continued unabated as the assaulting sections closed on the installations.

Before 1,000 yards were covered, the battalion commander decided to split the force into four separate groups. His main reason for this decision was the wounded who were slowing the rate of march. A second consideration was the possibility of pursuit. Four fifty-man units could move cross-country through the southern Tunisian terrain more quickly and with greater concealment than one 200-man force.

The seriously wounded and sufficient men to assist and protect them formed one group, while each of the three companies made an individual unit. Separating, the four groups began the forced march to the friendly outpost. As the night hours passed, company commanders realized the march was a race against time and coming daylight because, if the Rangers were to reach Gafsa that day, the truck trip must be begun no later than one hour before dawn. Exhausted men, their mission completed successfully, could be pushed only so fast. One company which had few wounded in its ranks reached the French garrison minutes before departure time for the trucks.

By 0800, one hour after daybreak, the other groups, except the seriously wounded, were back to the comparative security of the friendly garrison. An hour later, after hot coffee and "C" rations, the Rangers were sleeping while French guards and patrols watched for a counterattack. Vehicles were dispatched to the first mountain hideout, where the three most seriously wounded men and their protecting section waited. By 1130 all the Rangers had reached the friendly position, and ambulances had evacuated the wounded to an aid station near Gafsa.

During the early afternoon, rumor of an enemy tank attack forming up in a mountain pass some six miles from the French outpost reached the resting Rangers. Rapid preparation to meet this possible attack was made, but the afternoon faded into evening without the tank force venturing from the shelter of the mountains. An hour after dark, trucks arrived and at 2230 the Rangers were safely asleep in their Gafsa olive-grove bivouac.

Late the next morning when the battalion commander assembled the Rangers for a discussion of the Sened operation, the following points were stressed as vital to the success of the night raid: (1) control, (2) contact, (3) confidence, and (4) invisibility.

Control, the paramount factor in any night operation, is readily accomplished if contact is maintained throughout the march to the objective and during the attack. Troops trained to maintain contact on the darkest night in all types of terrain will keep together during an operation, and with contact control is simple. Confidence in themselves as individual fighters and in their unit as an unbeatable fighting team is instilled in combat soldiers by long hours of training and maneuvers more difficult than any situation in actual battle. Invisibility to both the eyes and ears of the enemy is the key to surprise which demoralizes the enemy and leads to panic in his ranks.

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**In every battle plan, weapons must be fitted to the ground as well as distributed according to an idea, because the battle is fought on the ground and not in the imagination.**

—Major General J. F. C. Fuller

XUM

# Control of Transportation in a Theater of Operations —A Review of Selected Principles

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"THE important secret of war is to make oneself master of communications."

It was with this statement that no less a strategist than Napoleon himself expressed the importance of mastery of communications in the conduct of warfare.

*Mastery* is *control at will.* The term "communications," as used by Napoleon, today includes all the routes, land (railway and highway), water, and air, together with their accessorial facilities such as telephone, telegraph, and radio, which link a military force in the field with its base of operations, and along which supplies, reinforcements, and evacuees are moved. Therefore, mastery of communications represents the ultimate in efficient employment of all these forms of communication.

Mastery of transportation is obviously a corollary of the mastery of communications. It is only through mastery of transportation that maximum efficiency in its employment may be attained. Availability of usable transport (mechanical, animal, or human) may limit the support which may be afforded tactical operations, and thereby limit the scope of those operations; but nothing can be done about this limitation except through the provision of additional transport. Inadequate or inefficient control of transportation can also, and equally effectively, limit the scope of tactical operations; but mastery of transportation precludes inadequacy and inefficiency of control. Therefore, mastery is the goal toward which every step in the development of plans for the use of transportation must be directed in order that available transport may be used to maximum advantage.

The general problem of transportation in a theater of operations may be resolved into two component problems: operation and control. Operation of transportation is the physical production and maintenance of transportation service, as exemplified in the operation of railway trains and other transportation facilities and the maintenance of right-of-way and equipment of the railways. Control of transportation is the regulation of the use of transportation services.

Control of transportation in a theater of operations may be expressed in: (1) priorities in the use of transportation, (2) movement control, and (3) traffic control.

The establishment and application of priorities in the use of transportation is a means whereby one movement may be accorded preference over another. In the broad sense every movement in a theater of operations is made in furtherance of the one over-all combat mission. Therefore, it is logical and necessary that priorities of movement be established by the theater commander. This establishment of priorities may be accomplished in greater or lesser detail as the situation requires. Theater headquarters may set up the system of priorities or it may set up policies from which more detailed priorities may readily be derived and established by a subordinate headquarters.

There should be one consistent system of priorities for the entire theater or for any portion of the theater with an independent, or independently controlled, transportation network. While it is to be expected that the particular priority assigned to a shipment or class of shipment will change as the situation requires, from day to day if necessary, or that it will vary from army to army, it is necessary that a clearly defined relationship exists between any one priority and any other priority. For example, let us assume a hypothetical situation in which two Base Sections, A and B, have been authorized to assign priorities to shipments in accordance with the general policies established by superior headquarters. If Base Section A assigns a priority of 1-A to a shipment and Base Section B assigns a priority of 2-B to another shipment, confusion and improper

application of those priorities can result, unless any agency handling both shipments knows the relationship between priority 1-A issued by Base Section A and priority 2-B issued by Base Section B. If there is a relationship between the priorities 1-A and 2-B, clearly defined and known to all agencies governed by or applying them, then there is one consistent system of priorities in this case.

The application of priorities is accomplished in part through the allocation of transportation equipment for a movement and in part through movement control, both of which are means of according preference to one movement over another.

The procedure whereby priorities are applied through the allocation of equipment may be different in different situations, and in any situation will depend upon the will of the commander. In Allied Force Headquarters in North Africa, there were convened periodic staff meetings at which supply services and other agencies requiring transportation service forecast their requirements and the transportation service forecast the availability of transport. The conference determined an allocation of transportation service in accordance with the demands of the situation (which may be expressed in priorities); subordinate echelons made more detailed allocations of equipment on the basis of those of higher headquarters; and finally, the dispatcher of the —th Quartermaster Truck Company, theoretically, sent the last available truck in the company to Depot X instead of Depot Y, because the shipment to be made from Depot X was the most urgent. This was the procedure used in one situation, a situation in which there were, in effect, but one long railway and one long highway serving forward installations and troops, and in which there were but a few hundred thousand troops to be supported. In another situation the theater commander might delegate to the communications zone commander, to the Chief of Transportation, or to someone else, the authority to apply priorities through the allocation of transportation equipment.

Movement control, the second expression of control of transportation and another means of applying priorities, is the routing and scheduling of shipments to utilize road space and available transportation capacity effectively. It is a means whereby shipments may be routed to distribute best the transportation load to be imposed on the available arteries of communication, and whereby the movement of those shipments may be so coordinated with the movement of other shipments that congestion is prevented or, at least, minimized. Movement control furthers the application of priorities of movement by granting precedence in routing and scheduling to shipments of higher priority.

The extent of movement control required in a particular situation is dependent upon that situation. Movement of a small volume of traffic over an extensive network of roads will require a minimum of control in the form of routing and scheduling. As the volume of traffic increases or the extent of the transportation network available for carrying that traffic decreases, the importance of movement control rapidly increases. The importance of movement control in a situation where traffic is heavy and the road network is limited is poignantly expressed by a Division G-4, who learned of that importance in action: "Poor roads, single divisional roads, and demolitions have made this a major problem. On maneuvers in the United States we were accustomed to moving organizations and vehicles without any reason or control. You cannot do this in the combat zone. [Nor can you do this in any other zone under similar conditions.[1]] Everyone must be imbued with the principle that he stays in his own bivouac area until he has a cogent and legitimate reason for leaving. In attempting to solve the problem we have set up as part of the G-3 Section a 'Movements Control Section' whose primary mission is to schedule the movement of units and grant permission to use the roads within the division area. We have by no means found the answer to traffic control [movement control, as hereinbefore defined[1]] and the matter is so complex and important that I recommend comprehensive study of the prob-

[1]Comments added by the author of this article.

lem. In spite of everything we have done we still have traffic jams, and only complete air superiority has saved us from serious losses."

It is essential that consideration be given in planning the extent of movement control to elements of the situation other than the available transportation network and the estimated transportation load. For example, if an extensive network of highways were existent in a certain area, and if the transportation load were to be relatively light, *but* the traffic were to be canalized to a few principal routes, the importance and the extent of movement control necessary in the situation would increase with the canalization. It is obvious, too, that movements of civilians and of Allied forces in the area would affect the planning of movement control.

The nature of movement control may be different for the different forms of transportation, depending upon the characteristics of their operations. For example, railway operations are characterized by the movement of large tonnages in a relatively small number of units (trains). In this case, the routing and scheduling of trains may be accomplished in one office as a function separate and distinct from the routing and scheduling in another office, and in a more general manner, of shipments to move on those trains. In the case of highway transportation, which is characterized by the movement of smaller tonnages in a relatively great number of individual units (trucks), the effecting of movement control would embrace at the same time the routing and scheduling of the trucks and the shipments.

The principles of movement control have long been recognized and employed under various appellations in the control of rail transportation. They have not been as clearly recognized in their application to the control of motor transportation, as is evidenced by the comments of the G-4 previously quoted.[2]

[2]During World War I the French employed the principles of movement control when they encountered a situation wherein it was necessary to supply a large force by motor transportation over one main highway. In that situation they controlled movements over the highway under "block" system. A truck or convoy could enter or leave the highway only at designated control points, and could travel on the highway only by permit and in accordance with a prearranged schedule.

The lack of recognition of these principles by our forces may be due in part to the excellence of the highway system of the United States, and the fact that this system has not been called upon to bear capacity traffic for a protracted period of time. As our forces have gained experience in operations in regions having limited highways and highway facilities, the principles of movement control, as applied to highway transportation as well as rail transportation, have become more clearly recognized and are assuming growing importance. It is essential that the nature of and the need for movement control be recognized and that it be applied to *all* forms of transportation as the situation requires.

Traffic control, the third expression of control of transportation, is herein defined as the enforcement of traffic regulations and road discipline. (It will be observed that in this definition the term "traffic" is used in the narrower sense rather than in the broader sense which would make the term "traffic control" synonymous with "control of transportation.") Enforcement of speed regulations, black-out regulations, rules with regard to careless driving, etc., are forms of traffic control as herein defined. Highway traffic control is normally a function of the Military Police.

It is very important that the difference between movement control and traffic control, as herein defined, be clearly understood. Confusion and overlapping assumptions of authority have resulted from the failure to differentiate between these two forms of control. Both Military Police and Transportation Corps officers have told the writer of instances in the United States wherein Military Police or Transportation Corps personnel have assumed authority belonging rightfully to the other, because the distinction between movement control and traffic control was not clearly understood by both parties.

In considering transportation in a theater of operations, all forms of transportation should be thought of as components of an integrated whole. Training doctrine with regard to this subject refers frequently to the

use of motor transport as a substitute for rail transport or other means of communication when railways and other means are unavailable or inadequate, and little is said about the detailed manner in which motor transport operations are to be carried out. Operations in this war have clearly shown that the relative importance of various forms of transportation varies from theater to theater, with the transportation situation, and that when transportation facilities are limited, no form of transportation is a substitute for any other form, but each form is a vital part of the whole. Therefore, transportation service should be considered as a whole rather than by parts of that whole.

Integration of the operation of transportation facilities is in many cases desirable, but unity in the control of those operations is *vital*. Motor trucks and railway trains may be operated by different agencies, but only through unified regulation of the use of those means of transportation can the services each performs be integrated into one whole. Therefore, plans for the control of transportation in a theater of operations should provide for unified control.

"Unified" control of transportation should not be confused with "centralized" control. Unified control is achieved when one agency is given the responsibility and commensurate authority to regulate the use of all means of transportation. Centralized control is the accomplishment of control within one office. One agency within a theater of operations may be assigned the function of control of transportation, providing unity of control; but that agency may perform its function within one office—centralized control—or in its subordinate echelons—decentralized control.

The optimum degree of decentralization of the control of transportation will depend upon a number of factors, including the characteristics of operation of the means of transportation involved, the organization of the agency given the authority of control, the territorial organization of the theater, and the extent of control required. For example, rail transport is characterized by its suitability to movement of large tonnages over long distances by a limited number of routes; motor transport is particularly suitable for the movement of smaller tonnages over lesser distances by a greater variety of routes. Rail transport would generally be more effectively controlled centrally, while motor transport would generally be more suitably controlled locally. However, under conditions existing in North Africa, it was found necessary to control motor transport in a Base Section from Base Section headquarters. Under other circumstances it would be feasible to decentralize control further, or to centralize control further. It is rather readily observed that unless the agency given the authority to control transportation is so organized that the central agency has direct authority over subordinate echelons engaged in control, either no decentralization would be in order, or lack of unity in control would result. The general movement of shipments over long distances through a number of sections of the theater would necessitate a greater degree of centralization of control. The best degree of centralization or decentralization of control must be worked out for each situation, consideration being given to all the factors involved.

In summary, plans for control of transportation in a theater of operations should provide for the performance of three principal functions: the application of priorities in the use of transportation, movement control, and traffic control. Plans should definitely provide for *unified* control, while the centralization or decentralization of control should be governed by the transportation situation.

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**If I always appear ready to meet an emergency, it is because I have long meditated on the possibility. It is no sudden inspiration that tells me what to do: it is study and meditation.**

—Napoleon

XUM

# Supply and Evacuation in Mountain Operations

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RECENT combat experiences in Italy emphasize the necessity for training in the technique of supplying units operating in difficult mountainous terrain. Our forces, after the seizure and extension of the original beachhead, have been confronted with a mountain campaign in which the enemy stubbornly resists any advance and fully exploits the defensive advantages of the terrain.

The general terrain in the area of advance consists of rugged mountains of fairly high elevation, cut by many narrow, twisting valleys and gorges. The road net is limited, consisting of a few widely separated main roads connected laterally by very poor secondary roads. Roads in general are narrow and winding and, in the higher regions, have steep and dangerous gradients. Retreating enemy forces have systematically demolished practically every bridge, blown out sections of roads, and sown all routes of movement with mines. Long periods of almost continuous rain have converted the cultivated valleys into seas of mud. Off the few serviceable roads, all movement is restricted to narrow and tortuous trails which will usually accommodate only a single file of troops or pack animals.

Such conditions impose severe restrictions on the movement of motor vehicles, and the supply of front-line elements is one of the major problems of the campaign. As the advance pushes forward in the mountains, supply of forward elements must be accomplished almost entirely by animal and hand transport. Generally, supplies are taken as far forward as possible by pack animals, but in some regions the terrain is so rough that it is necessary to resort to the use of hand carry. A typical comment on the supply problem which appeared in a report of an infantry regimental commander is as follows: "The difficulties of supply were tremendous, the only method being hand-carrying parties, and then in only small amounts, since the men needed both hands free to climb."

The problems and the detailed operation of the supply system in mountains will of course depend upon the climate and the season of the year, as well as upon the characteristics of the particular mountains in which the operation takes place. However, the difficulties encountered by our troops in the Apennine Mountains in Italy are typical of those encountered in any mountain campaign.

Rail lines are always scarce in mountainous areas. The road net is usually very meager and consists mainly of narrow and unimproved trails. Bridges are weak, and the frequency of defiles is a source of dangerous traffic congestion and delay. Combat elements may execute maneuvers that take them over extremely rough terrain away from any trail that can be negotiated by pack animals. Thus there may be many links in the chain of supply from depot to troops. Within the limits imposed by the tactical situation, supplies will be taken as far forward by truck as road conditions permit; then they will be transferred to pack animals and carried as far as the terrain will permit; from this limit, supplies will be transported any remaining distance by hand carry.

The system used in Italy by one infantry division is thus described by its G-4:

"Forward supply is now largely by pack train. We have one officer for each regiment in charge of a pack train platoon, which may vary from twenty to 150 miles. The number in each regiment is very flexible. It depends entirely on the terrain in the regimental sector. We have a total of 404 pack mules in the division with 360 men and five officers in charge of them. Two other officers comprise the division veterinarians. Most of the mules are too small for the Phillips pack saddle, so we use the local Italian saddles which are much smaller and lighter. We get the mules through military government agencies, who purchase them by purchase and requisition.

To our front line units, delivery of supplies is by ¼-ton to a 'jeep-head,' by mule train to a 'mule-head,' and from there on a man's back to the unit."

The load-carrying capacity of pack mules varies considerably. Each mule carries a certain amount of dead load including a grain bag, feed bag, and pack saddle to which loads are secured by ropes or hangers. In addition to this dead load, some mules may be capable of carrying a pay load of little more than 100 pounds, while others carry well over 200 pounds. Pay loads carried in the 75-mm pack howitzer field artillery battalions are as high as 250 pounds per mule. As a contrast, reports from Italy indicate that the average Italian pack mule is barely capable of carrying a load of 120 pounds.

The packboard (see Figure 1) is used to facilitate individual carry of supplies over difficult terrain. The exact weight of the load and the speed and length of march are largely dependent on terrain and weather. A load of fifty pounds can be carried with comparative ease by an average man. Loads well over 100 pounds can be carried for short distances. The packboard in no manner reduces the weight of any load, but it does make it easier to carry by properly distributing the weight and leaving the soldier's hands free for climbing.

The packboard consists of a frame to which loads may be lashed. The frame is of a size to fit conveniently the back of an average man. Longitudinal edges of the frame are turned down and a canvas is drawn tautly across the upturned edges to provide a cushion between the frame and the packer's back. Thus an open air space is provided between the body and the load, which protects the back from hard and irregular objects being carried.

Experience with packboards in Italy has been entirely satisfactory and they have been used for the transport of all forms of supplies. The necessity for these boards is apparent in the following comment of an infantry battalion commander:

"All rations, water, and ammunition must be hand carried to front-line units. You can get the stuff up only part of the way with mules because of the steepness of the slopes and the lack of trails . . . At the present strength of our companies, it takes about

FIGURE 1.
PACKBOARD LOADED WITH FIVE-GALLON WATER CAN.

twenty men to carry up a day's supplies for one company; ten for rations, five for ammunition, and five for water . . ."

Weather conditions in mountains may be so uncertain that aerial supply can not satisfactorily substitute for normal ground methods. Aerial supply, however, is a valuable supplement and should be available to support regular supply methods in emergencies. In cold weather, suitable landing strips may be available on frozen lakes in the mountains. Supplies may be dropped by parachute, but this method is not always satisfactory. Strong winds may blow the supplies into enemy hands or on dangerous slopes where they cannot be recovered. Free drop-

XUM

ping (especially in deep snow) is a satisfactory way of delivering most supplies. The usual wrapping precautions must be taken and a colored streamer fastened to each bundle to facilitate recovery.

It has frequently been necessary in Italy to supply isolated units by air. Initially the dropping of supplies was by the use of combat planes but artillery Cub planes later proved more satisfactory. A report by a division quartermaster states:

"We have developed a method of dropping supplies, ammunition, and water to isolated units by Cub plane because the method of dropping by combat planes is too complex and the results are not satisfactory . . . One Cub plane can carry and drop about 100 pounds. Our Cubs have been equipped with Air Force bomb releases for this work . . . On these missions the Cub does not carry an observer, in order to stay within the allowable load limit. One plane can carry two five-gallon water cans wired to a board, ammunition up to a weight of 100 pounds packed in boxes, or two bundles of rations containing seventy-two "C" rations per package . . . We keep food, water, and ammunition sufficient for one battalion packed at the quartermaster company. If a call comes in from a regimental commander to G-4, these supplies can be dropped in one and a half hours provided weather conditions, etc., are OK. . . . The dropping is done from a height of about 400 feet and our pilots can usually put them within about twenty feet of the spot indicated by the receiving unit."

Whenever possible supplies should be initially packaged in containers suitable for carry by pack animal or packboard. If the final link in the chain of supply is pack animals, the supplies should be packed as far back in the chain as possible into packages of suitable size and weight for transport by pack animals. If the final link in the supply line is a dismounted carrying party, the packages should be reduced to a size and weight to facilitate individual carry. All supplies for use in deep snow should be contained in packages not exceeding twenty-five pounds in weight. This is necessary because it is very difficult for men on snowshoes to load or unload heavier bundles. Taking such features as this into consideration eliminates the inefficiencies of unpacking and repacking each time there is a change in mode of transport.

Supply is to a great extent dependent on the load normally carried by the individual soldier. This load will vary greatly with the season of the year and the particular mountains in which the operation takes place, but it is extremely difficult to hold the load to a minimum. The rifle and ammunition of the soldier are absolutely essential and they alone weigh about fifteen pounds. Every man must carry some rations. In snow and extreme cold he must carry extra clothing and some form of sleeping bag or he will freeze. If the combat soldier is to move about freely and fight efficiently in the mountains, he should not carry more than thirty to thirty-five pounds on his back if at all possible.

The rucksack (see Figure 2) is designed to facilitate the carrying of all the individual equipment necessary for mountain combat. It eases the burden by properly distributing the weight and leaves the hands free for climbing or firing weapons. The rucksack consists of a canvas bag secured to a light metal-tubing frame (which may be adjusted to fit comfortably the individual's back and hips), shoulder straps, a back strap, a belly strap, and a white camouflage cover. The packboard is preferable for carrying heavy loads but the rucksack is well adapted to carrying medium weight loads, especially the mountain soldier's individual equipment.

Mountain operations are such that elements of any unit, even including individual companies and batteries, may be so widely scattered as to make central messing impracticable, if not impossible. Companies and batteries may be equipped with portable cooking outfits that can readily be carried by pack animals. When pack animals are not available or their use is not feasible, it is possible for cooks to pack gasoline field range burners and aluminum utensils on packboards. Another possibility is to prepare food

in rear of the front lines and forward it by packboard while still hot. One assistant division G-4 reports:

"Front-line units get into many places where you cannot get even a mule up to

FIGURE 2.
RUCKSACK WITH BAYONET.

them. We heat 'C' ration cans in boiling water, then put the cans in 155-mm shell containers, and strap three containers to a packboard. The reports indicate that the food stays hot for four hours, which is long enough to get it to the front-line troops by dismounted pack methods. We have also sent up by packboard, hot water in five-gallon water cans, with each can wrapped in two blankets. Reports also show that the water arrives on the front line hot enough for the men to make cocoa or coffee."

There may be frequent need for small cooking devices such as the four-man gasoline stove or individual "Sterno" cans, especially for patrols, outposts, and the like. The disadvantages of individual cooking are in the added weight of the stove to be carried, in the fact that some men will be too cold or tired to cook, and in the difficulties of properly cleaning and caring for mess equipment.

Water supply will vary with the situation. Streams and lakes are usually plentiful in mountains; and in winter, water can be prepared by melting snow. The general opinion that the water in mountain springs is safe for human consumption is a false one and no water should be used that has not been purified or certified "OK" by proper medical authority.

The evacuation of casualties in mountains is a tremendous problem because of the difficulties of transporting wounded over rough terrain. Casualties which might be classified as "walking wounded" in ordinary terrain become litter cases in mountains because they must cross terrain which is extremely difficult for even an uninjured individual. As a corollary to this, the task of the litter bearers is greatly increased because they must traverse terrain that offers many obstacles for a man free of any load whatsoever. Furthermore, the dangers of exposure, high altitude, shock, etc., make

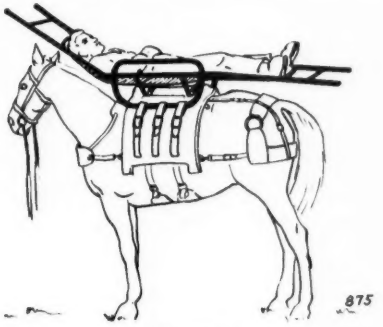


FIGURE 3.
THE CACOLET.

prompt evacuation extremely important. The following extract from the journal of a unit in Italy gives some conception of the difficulties of evacuation in mountains: "1350—S-3 told Chief of Staff of the supply diffi-

culties. It took six hours to evacuate a litter case to the bottom of the mountain . . ."

In very rough terrain, most of the evacuation of casualties must be by litter carry to the nearest point accessible to motorized ambulance. On snow, casualties may be transported by means of sleds or toboggans towed by medical personnel on snowshoes. A report from a British unit in Italy indicates that much evacuation has been by means of pack mules. There are several devices available for carrying recumbent cases by means of pack animals. One type, known as the cacolet, is shown in Figure 3.

Supply and evacuation are undoubtedly the most difficult and most dominant features in mountain operations. Supply and evacuation operations will usually be decentralized. Supply will always be difficult and the amount of supplies that can be provided combat elements will usually be very limited. No two situations will be alike from a supply standpoint. Standing operating procedure will frequently be modified and improvisation will be the rule rather than the exception. The supply plan must be worked out in detail for each operation, taking into consideration the exact conditions that will prevail.

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## Jungle Code

An article published by courtesy of the Intelligence School (India) in *The Journal of the United Service Institution of India* October 1943.

THE code of social intercourse in the jungle is simple. Your chief concern is not to endanger your comrade. Because of the risk that you may bring him, you do not light fires after sunset, nor shoot in the dark, giving away your position. You do not leave any mess behind that will breed flies. You do not ask him to convey your messages, unless it is his job to do so.

You always tell your comrade of any private mark you may have left on any particular trail, or any outstanding feature that may help him to find and keep to the difficult and tortuous paths he will have to traverse.

You do not drink deeply of any man's bottle, for it may not be replenished. You tell him of any spring or water-hole which may be near, but hidden from the trail. You share any superior knowledge you may have of what can be eaten with safety from that particular forest, and where it may be found. Who knows? It may save his life. You make sure that he has many before you take his cigarette. You do not borrow from him. You do not ask or volunteer information beyond your job or his job, for idle talk kills men. You do not grouse unduly, except, of course, concerning the folly of your own commander; you criticize no other man's commander.

Of those things which you do, the first is to be hospitable, and the second is to be courteous. The day is short in the heavy jungle, but the night is long and sorely tries the nerves of those unused to it. There is time to be helpful to those who share your adventure. If you are one who can keep the spirits of others high, spare no efforts to do so. The good-mannered guest transacts his business expeditiously, gossips shop for a little, and is gone.

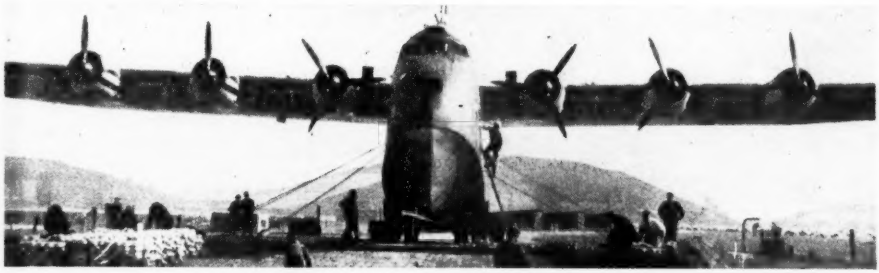
The man with the sharpest senses lives the longest in the jungle. If your companion's senses are blunt, keep him still, and use yours for him; you may thus prolong his life, and yours. Make friends with the local population. Even if you are clever, remember always you have much to learn from the man who is jungle-bred.

This code is the sum of fellowship in the jungle. It knows no rank, nor any exception.

# MILITARY NOTES AROUND THE WORLD

## GERMANY

*The BV-222 Flying Boat:*



The BV-222 is the largest plane of the German Air Force. The six motors have a total of 7,000 horsepower, giving the plane great speed and cruising range and making possible its employment as a transport and long-range reconnaissance plane on all fronts. The plane has a wing span of forty-six meters and a length of thirty-seven meters. Powerful armament in the form of cannon and heavy machine guns guarantee security and superiority in the air in case of enemy attacks. The plane has enough room for 100 infantrymen with march equipment. It has already transported thousands of wounded and several divisions during its engagements in the eastern, southern, and western areas of operation.

(*Berliner Illustrierte Zeitung*)

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*Comments on German Matériel:*

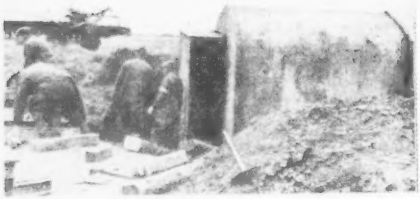
According to Major General G. M. Barnes, chief of the U.S. Army Ordnance Department's Technical Division, the German Army possesses the best enemy weapons. The Germans have developed a wide range of vehicles from a one-ton vehicle for use with infantry to a large eighteen-ton vehicle for hauling heavy types of artillery. The key attribute of these vehicles is interchangeability. The engines are of the same type and the tracks are basically alike. A minimum number of component parts have been used. One interesting feature is that the largest of these vehicles have a dual fuel system. A small tank is located under the dashboard connected through a selector valve. This tank contains high-volatility fuel for starting the Maybach gasoline engine. After starting, the engine is capable of running on low-grade fuels.

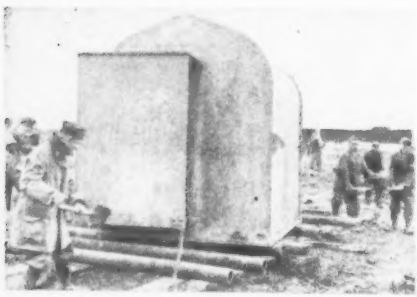
In the tank field, the light Mark I and Mark II models have been withdrawn as too feeble to stand the pace of modern tank

warfare. The Mark III and Mark IV models have been constantly improved, the former nineteen times and the latter seven times, but they proved inferior to American armor in the North African campaign. A 36-ton Mark V tank has been rarely seen on the battlefield. The heavy Mark VI "Tiger" tank is being knocked out by our hard-hitting bazooka.

(*Army Ordnance*)

*Steel Shelters for the Front:*





These steel shelters, each weighing about twenty-two tons, are moved to the front where they are used in the construction of complete systems of fortifications in open terrain.

(*Illustrieter Beobachter*, Munich)

*Asbestos Coating on Tanks:*

Many German "Tiger" tanks and others captured by the Red Army on the southern front are coated with an asbestos mixture as a protection against incendiary compounds. Some of the vehicles also carry additional steel shields.

(*Information Bulletin*, Washington Embassy of the USSR)

## GREAT BRITAIN

*Modifications in the Mosquito:*

The latest fighter-bomber version of the Mosquito carries 1,000 pounds of bombs in the fuselage and one 500-pound bomb under each wing. Thus the fighter version now carries twice the bomb load for which the original Mosquito bomber (without armament) was designed in 1940.

Trials made clear that the all-up weight could be increased, and de Havillands put forward the suggestion that by shortening the vanes of the standard 500-pound bomb, four of these could be accommodated in the fuselage space in place of the four 250-pound bombs, thus doubling the destructive load. Meanwhile, the fighter version was developed separately to counteract the night blitz. Then two 250-pound bombs and later two 500-pound bombs were mounted behind the cannon. Later, long-range drop tanks were mounted beneath the wings. Then racks for two 250-pound bombs were fitted, interchangeable with drop tanks, and afterwards these were substituted by two 500-pound bombs.

This explains the remarkable usefulness of the basic fighter version which, by quick change-over between bomb-racks and extra tanks, is able to serve in the field as a long-range fighter or as a fighter and bombing intruder of range and destructive load accurately adjustable to individual sorties.

(*The Aeroplane*, Great Britain)

*Midget Submarine—The "X Craft":*

Quite early in the war it was known that the Italians and Japanese were in possession of a number of two-man midget submarines, and it is thought that the Soviet also possess similar craft. It was not until October 1943, however, that the British public was made aware that Great Britain, too, possessed "X

craft" or midget submarines. When the attack on the *Tirpitz* in the Alten Fiord of Norway was carried out in September last, it was vessels of this type which wrought the severe damage then inflicted on the big German battleship. Substantial details of the "X craft's" construction are still secret, of course; but it would appear that each vessel is manned by a crew of three, and that the craft generally are "scaled-down" models of full-sized submarines. It is thought that in the *Tirpitz* attack these midgets were carried aboard a bigger vessel and launched from such a distance that their voyage to the objective and their return to their floating base was practicable.

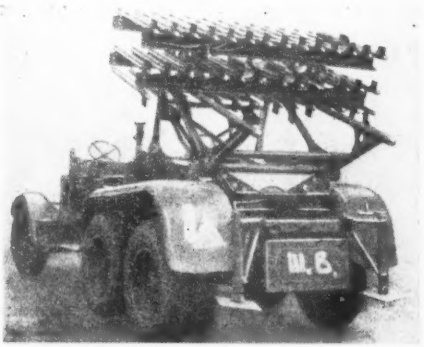
The picture shows a member of the crew beside the upright post containing the periscope. The hull of the vessel only emerges about three feet above the water, and there is no normal conning tower as in the case of a full-sized submarine. Its length is no greater than a full-sized launch. There are no deck guns.

(*The Sphere*, Great Britain)

## U. S. S. R.

*Soviet Rocket Guns (Salvo Guns):*

There are several types of rocket guns in the Red Army. Rocket projectiles are fired



SOVIET 35-ROUND ROCKET GUN.

automatically, as a rolling salvo. The propelling charge is ignited electrically. Both high explosives and incendiary rockets are used. When fired, the projectiles are guided by means of guide screws which engage in the grooves of the firing troughs. This permits the firing of other calibers from the same gun.

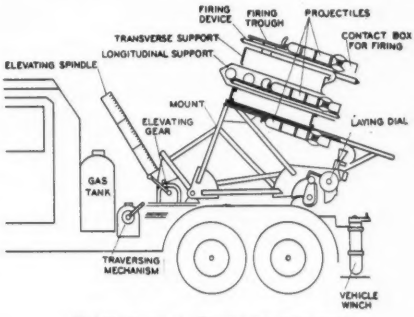



DIAGRAM OF A SOVIET ROCKET GUN.

Some descriptive notes on Soviet rocket guns follow:

Caliber 7.5 and 8.2-cm rocket guns; projectiles in one salvo, 35; maximum range, 5,300 meters. Thirty-eight firing troughs are arranged in three rows one above the other in

the rear end of a truck. The truck is held stationary during firing by means of lifting jacks under the rear end of the frame.

Caliber 7.6-cm rocket guns: projectiles in one salvo, 32; maximum range, 6,000 to 7,000 meters. Description is the same as above,

SOVIET 16-ROUND ROCKET GUN.

except for the different number and arrangement of firing troughs.

Caliber 8-cm rocket guns: projectiles in one salvo, 4; maximum range not known; framework mount for tubes placed on ground for firing; angle of traverse, 360 degrees.

Caliber 13, 13.2, and 13.5(?)-cm rocket guns: projectiles in one salvo, 16; maximum range, 9,000 (?) meters. Eight double-sided, double-firing troughs are arranged in a row, each taking one projectile at top and one at bottom, mounted on an aiming stand in the rear of a truck.

(*Taschenbuch, Russisches Heer*, Germany)

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## BRAZIL

*New Parachute:*

A parachute to revolutionize jumping is being tested by Brazilian Air Force experts. The inventor—Charles Astor, French parachute instructor with the air force—claims that jumps can be made in perfect safety from a height of 120 feet.

(*U. S. Navy Magazine*)

## JAPAN

*The Japanese "Hamp":*

On the flying line at Wright Field is a Jap fighter plane, the "Hamp," a late model of the Zero family. Outwardly it has some marked differences from the Zeke, earlier model Zero: squared-off wing tips (like the P-51) give it a three-foot shorter wing span; the cowling which circles its engine is smaller in diameter; the airscoop which cools the engine is atop the cowling instead of below; the ailerons are shorter; and 100 horsepower has been added to its engine. The "Hamp" has a maximum speed of 350 miles per hour at an altitude of 17,000 feet.

Used widely in the South and Southwest Pacific as a land-based and carrier-based plane, the "Hamp's" all-metal structure is light and fragile. The construction is generally the same as our own but the skin covering is much thinner. This is evidenced in flight when the wings wrinkle and scare most pilots who fly the ship for the first time. Yet the wing covering is tough. Apparently the Japs are using a new kind of aluminum-alloy for this purpose.

(*Air Force*)

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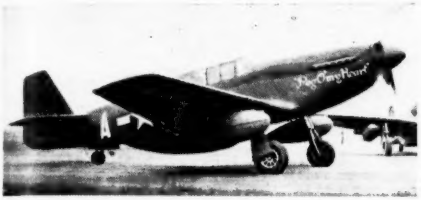
## UNITED STATES

*Rockets at Rabaul:*

A Marine torpedo plane squadron made the first airborne rocket attack against the Japs at Rabaul, their planes being equipped for firing the missiles from mechanisms on both wings. The attackers dropped into Rabaul harbor from 12,000 feet and made a low broadside approach on a 450-foot cargo ship. The "bazooka bombs" are set on either wing and fired by a mechanism in the pilot's cockpit. So far, they have been used in the South Pacific only on Marine Grumman Avengers and make the torpedo bomber an even more versatile aerial weapon than before, adding rockets to its former armament of torpedoes, bombs, and machine guns.

(*The Marine Corps Gazette*)

*The P-51 Mustang Long-Distance Escort Fighter:*



The United States Eighth Air Force's great raid of 11 January brought news of a new long-distance fighter escort aircraft, the P-51. This aircraft, which has been described as the longest-ranged single-engined fighter in the world, is an improved version of the Mustang, with a Rolls-Royce Merlin engine and auxiliary fuel-tanks carried beneath the wings.

(*The Illustrated London News*)

The War Department has disclosed that North American's P-51 Mustang fighter is rated as the world's fastest airplane as well as top performer from the standpoint of ceiling and range. Powered by a Packard-built Rolls Royce Merlin engine, with a two-stage, two-speed supercharger and four-bladed propeller, the Mustang has a speed of more than 425 miles an hour in level flight and a tactical radius of action of more than 500 miles. It is capable of reaching an altitude of 40,000 feet. The Mustang is now providing effective escort to heavy bombers raiding Germany's innermost defenses, and is expected to prove of major importance to the Allies in the coming months as cover for the invasion forces.

(*U. S. Air Services*)

*Three-Dimensional Pictures:*

The three-dimensional pictures known as Polaroid vectographs have been used for more than a year in the battle against the Japs. Although a vectograph is as thin as a piece of paper, it appears to have all the depth of the actual scene when it is viewed through light-polarizing spectacles. Photographs from which the vectographs were made at Munda were taken at great risk to the flying photographers who skirted areas where Jap gun emplacements were known to be located. Vectographs were particularly helpful to landing parties and to dive-bombing personnel. By revealing land details and the positions of enemy installations, the vectographs enabled the key men in operations to know the lay of the land even before they engaged in offensive action against the objective areas. Good landing points on the beach and folds in the ground for providing protection against enemy machine-gun fire were disclosed clearly and precisely.

Developed by Polaroid Corporation, the vectograph process is said to be the first practical and rapid system of making faithful three-dimensional pictures which can be viewed simultaneously by any number of persons wearing the special polarized spectacles.

(*U. S. Air Services*)

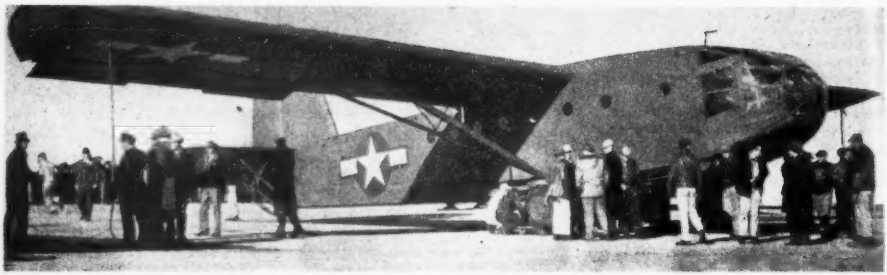
*The New M-4 High-Speed Medium Tractor:*

The United States Army's new M-4 tractor is shown below towing a 155-mm "Long Tom" during a training maneuver. Besides towing

the gun and carrying the necessary ammunition, the M-4 can accommodate a gun crew of eleven artillerymen and a driver. Fast and maneuverable as a large army truck, it is heavily armored and mounts a rapid-firing light gun for defense against attack from the air or the ground.

(*The Sphere*, Great Britain)

*New Giant Glider:*



The Army Air Forces' new glider, YCG-13, has undergone its test flights and now is in production.

The glider weighs approximately 8,000 pounds. The fuselage is built of steel tubing. This affords good protection for crew and cargo in the event of a crash landing. The wings are all-wood construction. Fuselage and wings are covered with tough fabric.

An innovation of the giant glider is its permanent landing wheels (as well as skids) that are retained during flight and not dropped off, as was formerly the case with many gliders. In a craft of this size wheels are necessary to provide protection for its belly and to keep the craft in readiness for additional take-offs and landings. If the destination of the craft is known to be of rough terrain, the wheels can be dropped and the craft landed on skids. The glider can carry thirty troops and crew.

(*Flying*)

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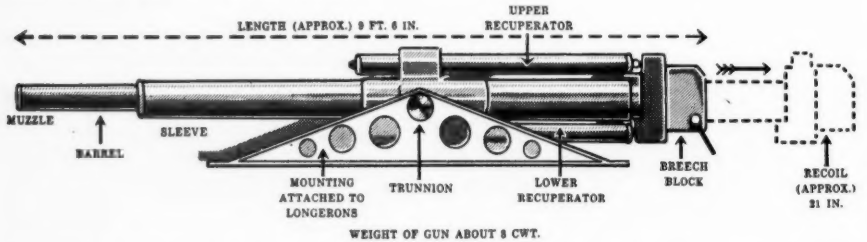
*The Three-Inch Mitchell Bomber Gun:*




WEIGHT OF GUN ABOUT 8 CWT.

The Mitchell B-25 medium bomber is now being equipped with a 75-mm (3-inch) gun. The biggest gun previously carried by aircraft was little more than half its caliber—the 40-mm cannon mounted on the "tank-busting" Hurricanes. The new weapon brings the Mitchell closer to the idea of a flying gun-platform than airplanes have ever been. The big gun, mounted to fire through the underside of the Mitchell's nose, is loaded by a member of the crew known as the cannoneer, and is presumably aimed and fired by the pilot. The cannon has an appreciable blast and recoil, but these are said to have little effect on the aircraft in flight, its reduction in speed being surprisingly slight for the addition of such a heavy gun.

(*The Illustrated London News*)

# FOREIGN MILITARY DIGESTS

## Cavalry in the Eastern Theater of Operations

Translated at the Command and General Staff School from a German article by Emmerich Suhay in *Pester Lloyd Abendblatt*, Budapest, Hungary, 4 March 1944.

AT THE beginning of the first World War, cavalry, generally speaking, was not correctly used by us. Some individual divisions were moved here and there in forced marches till, totally exhausted, they lost a part of the valuable horse material. Nevertheless, German cavalry did great work in the battle of Vilna in 1915 and in Rumania in 1916.

Also, everyone knows of the decisive entry into action of the English cavalry in the Palestine campaign, but of still greater significance was the activity of the Turkish cavalry corps in the war of liberation against the invading Greek army in the year 1922. Here we have a classic example of the command of a cavalry corps by a genuine cavalryman.

The strategic situation in the western theater of operations was not favorable for the employment of large bodies of cavalry. Besides, cavalry divisions were often jammed between the armies. The real reason for the relatively small successes of the German cavalry during the advance in France and during the battle of the Marne, was, however, the inadequate fighting power of the cavalrymen for a war in the western theater of operations.

After the first World War, as a result of the lessons learned in it, there followed a general dissolution or motorization of the cavalry in most of the armies. Only the eastern nations, Poland and Soviet Russia, retained relatively powerful cavalry formations. As we know, Poland had forty regiments of cavalry, and Soviet Russia has many corps and divisions.

While, in the campaign of 1939, small German cavalry formations did excellent work in reconnaissance and security service (even enemy batteries were captured in surprise attacks), the Polish Uhlans, true to their traditions, offered themselves up bravely in cavalry attacks, but to no avail. The Polish cavalry lacked heavy weapons, the necessary fire power, and collaboration between horse and motor. Also, there seems to have been no observation or combat aviation assigned to it.

On the basis of the experiences of 1939, the Soviet Russians reorganized and rearmed their cavalry and motorized its supply formations. The men received new "Simonov" automatic rifles and machine pistols. The number of machine guns was considerably increased and some of them mounted on light horse-drawn wagons. Particular attention was given to antitank defense.

In the campaign of 1941, Hungarian, German, and Rumanian cavalry were engaged in the Russian theater of operations, and it was often possible to employ them with success. Their fire power was increased, especially by means of antitank guns and antitank rifles. The latter were transported on pack horses.

The development of the motorized formations and of aviation, as well as the increasing fire power of the artillery and infantry, influenced the tactics of large cavalry formations on both sides.

Every cavalry officer who went through the

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first World War on the eastern front or was for years garrisoned in Eastern Galicia, knows that at certain times and in certain places in the spring and fall and frequently in the winter when there is a great depth of snow, only a mounted man is capable of getting about at all times. This fact had also to be learned recently in the eastern theater of operations in the campaigns of 1941-1944. Hungarian cavalry formations, individual squadrons, were able to record fine accomplishments in the retreat battles in the abnormal temperatures of over forty degrees below zero.

Naturally, the cavalry in the east also fights dismounted. The horse serves more or less as a means of locomotion. However, smaller detachments and patrols are able to execute successful surprise attacks on enemy formations, especially in retreat, and break them up.

The Soviet Russians always employ their cavalry in great masses—divisions and corps—for the solution of secondary problems, security, etc.; for according to their view, cavalry formations which are scattered out, when worn down by the enemy, rapidly lose their striking power.

Hence, just as in the years 1914-1915, the Russian cavalry has also been used advantageously in the present fighting in holding operations.

As is evident in the various communiqués, cavalry has regularly been used in fire combat on the flanks in the case of the larger frontal attacks. In defense, cavalry has regularly been employed as a main reserve. After every operation, the effort has been made to bring up the cavalry formations as quickly as possible as mobile reserves. In pursuit, harassing the connecting elements in the rear, etc., the cavalry forces on both sides on the eastern front have shown their former importance.

Today, aviation must be designated as the most dangerous enemy of cavalry in open terrain. It is just here that antiaircraft defense plays a great role, especially on the march when a quick and effective employment of defense means is required. Modern cavalry must be specially trained to scatter quickly and make use of all cover.

In the present eastern campaign it has been shown that the training objective of modern cavalry remains the "straight-shooting rider" in contrast with the "poorly-riding rifleman."

So far, but few details have been learned relative to the employment of cavalry in the eastern theater of operations, but the old saying that cavalry, to be successfully employed, always requires a commander with a good head, who always knows the correct moment for going into action, remains true.

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## German Antitank Defense

Translated at the Command and General Staff School from a Russian article by Lieutenant Colonel N. Kupenko in *Krasnaya Zvezda* 16 March 1944.

MANY changes have recently occurred in German antitank tactics. Small-caliber antitank artillery and antitank rifles have been found to be not sufficiently effective against medium and heavy tanks, and the German Command, therefore, has taken steps to increase the fire power of the antitank artillery. New antitank guns with tapering barrels (75/55, 42/28, and 28/22-mm) are appearing in greater numbers. Used with new types of ammunition, the guns have higher muzzle velocity and hence greater armor-piercing quality. Their tanks are also being equipped with heavier guns.

This rearming of tanks and antitank artillery, however, is far from complete. In spite of the efforts of German industry, a considerable number of old models, effective only against light tanks and when their fires are concentrated, are found side by side with the modern weapons.

In addition to the re-equipping of tanks

and antitank artillery, the Germans are introducing a number of changes in their antitank tactics. Basic in the new tactics are antitank strongpoints located in the depth of the main battlefield. These strongpoints are established to take full advantage of the terrain, to utilize it for better antitank defense. The strongpoints include antitank and antiaircraft guns, special infantry tank-destroyer groups discussed later in this article, and infantry units. The terrain is reinforced by various obstacles (antitank ditches, tank traps, barriers, minefields, etc.). The strongpoints serve a double purpose: to delay the attacking tanks and, at the same time, to lure them under the antitank barrage laid by a large number of antitank guns.

The Germans group together antitank guns of different caliber. This is explained by the tendency to utilize correctly all the guns in accordance with their possibilities and to enable them to fight different types of tanks at different ranges. In their instructions and directives, the Germans emphasize that antitank defense should be extremely active and should include all infantry and antiaircraft weapons. Each gun should have an unobstructed field of fire of not less than 500 or 600 meters. Medium and heavy guns are placed, not near the forward edge, but in the depth.

These modifications in antitank defense are due to the increased maneuverability of mobile troops. Our tankmen, for instance, very often manage to pursue the Germans continuously without allowing them to disengage and consolidate new defensive positions. Because of this, the German Command has instructed all antitank units to strive first of all for battle effect in the selection and occupation of positions, and to neglect proper camouflage and defense measures. The selection of position should, in all cases, guarantee a quick opening of fire, while camouflage measures and the search for defensible and concealed positions are likely to result in lost time and may have a negative effect upon the success of the battle.

It is interesting to note that the Germans, in modernizing their antitank defense, have to take into account the possibility of unexpected breakthroughs and the appearance of our troops on their flanks and in the rear. This is the reason why the Germans consider it extremely important to prepare their artillery for close-range defensive battles of two types: with tanks, and with tanks and infantry acting together.

In their new instructions pertaining to close-range engagements with tanks, the Germans emphasize the fallacy of the previous belief that in tank attacks individual guns and even whole antitank batteries can easily change their positions and displace to new areas better adapted for defense. The Germans do not believe in the wisdom of such displacements since all these weapons are needed to support the infantry. Such displacements are often impossible because of the enemy fire, and are generally difficult under the conditions of the present swiftness of tank attacks.

The system of German active antitank defense is now bolstered by special mobile reserves made up of heavy antitank and assault guns operating in the direction of the main tank attack.

The Germans now give more attention to the training of infantrymen in the methods of close combat with tanks. Especially important are the so-called "infantry tank destroyer groups." The tank destroyer group consists of three men and sometimes of five. Two or more such groups are often joined together to form squads or even platoons. Tank destroyer squads and platoons are used whenever there is a shortage of antitank guns or when the terrain is better adapted for the operation of tank destroyer groups. It has been ascertained that there may be as many as three tank destroyer squads in an infantry battalion, two in a company, and one in an artillery battery.

These groups are equipped with magnetic mines, antitank mines (T-35, T-42, and T-43) with detonators of various types, charges of explosives, hand grenades (individual and bundled), rifle and armor-piercing grenades, and blinding, smoke, and incendiary weapons.

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The incendiary equipment consists of flame throwers, incendiary bottles, and vessels filled with gasoline.

In December 1943, German infantry and engineer units received a new 88-mm antitank rifle, *Ofenror*, of the rocket type, and the antitank grenade, also of the rocket type, called *Faustgranata*. Both the rifle and the grenade are primitive and imperfect and have proved to be ineffective.

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## German Armored Trains

Translated at the Command and General Staff School from a German article in *Hamburger Fremdenblatt* 24 March 1944.

EVEN in the battles of the Revolution of 1848, armored trains were employed by the Austrians who, clear into the period of the World War, were to remain virtuosi in this field. Armored trains were successfully used in the Franco-Prussian War, in the Boer War, and in the Russo-Japanese War.

At the beginning of the first World War when Germany did not have bona fide armored trains at her disposal, she made use of improvised armored trains (locomotives protected by armor plate suspended by chains; freight cars protected by means of railroad rails). Such a train afforded masterful protection when contact was broken with the enemy on the occasion of Hindenburg's withdrawal at Ivangorod to the Silesian frontier. It boldly steamed out to meet the pursuing Russians, and by means of the fire of its artillery it forced their advance guard to deploy time and again, thus permitting the withdrawal of the troops and of the last supplies of ammunition from the city entrusted to its protection. During the period of the stormy advance in the west, armored trains of this type took over the task of clearing the remains of enemy troops and partisans from the country in the rear of the armies, thus contributing materially to the rapid pacification of these areas and the establishment of an orderly administration.

The great hour of the armored train struck, however, when the war of position on the eastern front in 1917 again became a war of movement, when the Central Powers moved out for the occupation of Livonia, Esthonia, and the Ukraine. The vastness of the area gave the armored trains opportunity of using their speed and combat strength for the benefit of an unimpeded advance of troops, parallel to the right of way. Even at that time, the expression "railway war" was used.

The experience gained in the first World War has borne great fruit in the present one. The armies of Greater Germany have a considerable number of armored trains at their disposal. They consist of special heavily-armored cars. The locomotive, which naturally is also heavily armored, is usually placed in the middle of the train in order to provide the armored vehicles with a free field of fire toward both the front and the rear. The armored cars are armed with automatic weapons of all types and calibers (machine guns, cannon, antiaircraft and antitank guns, and mortars). They are equipped with signaling apparatus, with explosives, and with material for repairing broken stretches of track. They carry, besides the technical personnel and the gun crews, assault units of infantry and engineers, and even tanks, for operations outside the trains. They are provided with armored scouting cars, which provide security for them on the tracks or along the right of way and execute reconnaissance missions.

Thus, armored trains have become traveling fortresses—battering rams in attack and centers of resistance in defense—capable of magnificent performances operating either independently or in cooperation with other arms of the service. Their long-range weapons give most effective support to the assault detachments and tanks which have left them to carry out an operation, or to the vanguards or attacking waves of other arms.

In defense, they constitute, with their protective armor, a fire-spitting hedgehog formation which can become an anchor for broad expanses of the front. Incidentally, now as always, the armored trains find surprise the most important factor of success, and vast expanses their best hunting ground. They know what great moral and material effects they are able to produce by the sudden concentration of fire from their numerous automatic weapons, how their steam power enables them, after a successful blow, to disappear just as suddenly as they appeared.

A GERMAN ARMORED TRAIN HEAVILY CAMOUFLAGED. FROM THE STEEL DOORS, GRENADIERS RUSH TO THE SUPPORT OF EMBATTLED COMRADES. (FROM "BERLINER ILLUSTRIERTE ZEITUNG," BERLIN, GERMANY.)

Besides taking a hand in the fighting on the front, armored trains are especially suited for the execution of the following tasks: exploration of a railway network; occupation and guarding of bridges, railway culverts, embankments, railway stations, and station installations on this network; protection of troop trains and of the loading and unloading of troops; support of railway guards; covering of a retreat; establishment of bridgeheads; relief of minor surrounded groups of forces; protection during the period of organization of a position; reinforcement of the artillery on the main line of resistance; support of counterthrusts; blocking of points where a penetration has been effected; maintenance of order and quiet in occupied areas; and the combat of partisan bands.

A few examples along these lines: On the first morning of the Polish campaign, an armored train, descending suddenly on the Kolnitz railway station, seized and held it by means of its assault unit till the arrival of the infantry. Nine months later, at the beginning of the campaign in the west, an armored train succeeded in reaching the bridge over the Meuse at Geneep, and occupied it before the enemy was able to blow it up. A boat which a Dutch demolition detachment attempted to move to the bridge site was destroyed by a direct hit; the bunkers of the Peel fortifications opposite were silenced by means of fire directed at their firing ports, and their crews were forced to surrender. To be sure, there were, under the fire of Dutch snipers, critical moments for the train, which, after fulfilling its mission, was put out of commission by running onto a Dutch mine. But the crew held their own till combat aviation summoned by radio brought relief, and the victorious attack by the infantry on the Peel fortifications eliminated all danger. In the mobile defense operations

during the winter on the eastern front, an armored train blocked for half a day the attack of the enemy. Another train annihilated a Bolshevik sharpshooter battalion which had broken through our lines in sleighs and on skis before the latter had succeeded in blowing up an important bridge. A third prevented the filtering of strong enemy forces into a wooded and marshy area through a break in our lines. One armored train, in a period of two months' time, covered a distance of 8,500 kilometers in forty-five sorties in combating partisan bands.

The fighting engaged in by armored trains makes heavy demands on their crews from the points of view of tactical and technical knowledge, resoluteness, and readiness for action. There is usually no time for long deliberations. Only quick action guarantees success.

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## General Staff Officers

Translated at the Command and General Staff School from an article by Lieutenant Colonel Gregorio Lopez Muniz, General Staff, Spanish Army, in *Ejercito* (Spain) May 1943.

THE complexity of the missions of the general staff, the great significance of its acts in which an oversight or error may be followed by incalculable consequences, the multiplicity of situations in which it may find itself, demand special aptitudes and qualifications in the officers called upon to fulfil this function.

The first is that of being able to sacrifice one's own convictions if necessary. The chief of the general staff is absolutely duty bound to submit to the general, without any hesitation or mental reserve, his opinion, or the proposals that his detailed knowledge of the situation suggests to him, defending them with the arguments that served to orientate him with respect to them. But when the general makes his decision, even though the chief's personal opinion be contrary to it he will apply himself to the development of the decision with the same enthusiasm, the same will, and the same good faith as if he himself were the author of it. This loyalty, this identification with the commander which may go so far even as the annulment of his own personality, is the highest virtue of the general staff officer, inasmuch as his sacrifice remains wholly unknown.

The general staff officer has need of extensive technical and tactical knowledge of all orders. Method and foresight must be the fountain of inspiration of his labor. His intelligence must be of a type that will permit him to appreciate fully the various aspects of a problem and discover without vacillations the best solution for it. His work is nearly always performed under the pressure of time and often in an atmosphere of nervous tension in the midst of which he must display calmness of judgment and tranquility of mind. He must be rapid in the formulation of his conceptions and quick in their execution, taking into account, at the same time, all the indispensable details, for he must never forget that the complicated mechanism of the arms and services does not begin to function until the orders which translate or materialize the decisions of the command have been started on their way and have arrived at their destination.

He has to be a man of action, and be endowed with great physical resistance to endure the hard tests of periods of crisis and to conquer sleep, that great enemy of the general staffs.

The constant relations that the general staff officer is called upon to sustain with officers of the various units, who almost always are of a higher rank than he himself, not only require an excellent education and exquisite tact on his part, but also constant discretion, the gift of knowing how to get along with people and of keeping in his own place. Never will his correctness or the good-natured words that he lavishes be excessive

on the occasions when he answers those tempestuous and frequently futile telephone calls which so often occur in the early hours of the morning just after he has retired for a bit of well-earned rest.

His conversations must always be imbued with healthy humor. Not that an artificial optimism is one of the articles of faith of the general staff officer, but he must certainly never lose sight of the fact that many eyes are fixed on him, that the most trivial of his words and acts are immediately made the subject of comments, and that very frequently they are misconstrued. The general staff officer can never be too prudent in his speech nor weigh his acts too carefully, but this should never prevent him from radiating confidence and enthusiasm.

In his service outside the general headquarters, which has to do principally with missions of reconnaissance and liaison, the general staff officer, wholly on his own, must display his qualities of calmness, observation, good judgment, tact, initiative, and abnegation. The observations that he has made, or the results of his studies, must always be presented to the command in an honorable and sincere manner, truthfully and dispassionately.

On the other hand, all these qualities will be inadequate if the general staff officer is not animated by a profound love for the troops whose privations and dangers he should share as much as possible with a sincere desire to help them constantly, without stopping at sacrifices or the burning of the midnight oil. Only in this way will he succeed in instilling confidence in them—that factor which is indispensable for the fulfilment of their difficult mission.

And lastly, when the hour of praise and congratulations arrives he must be able to withdraw himself modestly to one side without demanding any other satisfaction for himself than that of having fulfilled his duty, never calling attention to his own merits.

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## Lessons From Salerno

From an article by Lieutenant General Sir R. Gordon-Finlayson in *The Army Quarterly* (Great Britain) January 1944.

GENERAL Clarke's Fifth Army began its landing at 0400 hours near Salerno, with his British divisions north and the U. S. troops south of the river Sele. Unfortunately, the Germans, doubtless through Italian leakage over the armistice discussions, discovered that a landing at Salerno was to be attempted. There was no element of surprise and our ships were fired upon before anchoring. It is now known that the 16th Panzer Division, recently reformed in place of the one lost at Stalingrad, had been hurried down from the north and occupied the ground overlooking our landing places on the 8th of September. However, heavy naval and air support, added to the gallantry of the Fifth Army, enabled us to effect a landing; but the 16th Panzer Division held the landing troops to their comparatively small bridgeheads long enough to permit their own rapid reinforcement by the Herman Goering Panzer and 15th Panzer Divisions. That force again was quickly strengthened by the 26th Panzer and 29th Panzer Grenadier Divisions, which were withdrawing up the "toe." Thus, a force of five divisions, strong in armor, was rapidly built up in spite of the intensive action, over a period of three weeks, of the whole of the Allied Strategical Air Forces in the Mediterranean and Middle East against the very communications by which these divisions arrived and were supplied.

Whether our commanders were confident that our air power would block these communications or not, one cannot say; but, without casting any reflection at all upon the magnificent work the air forces performed as a powerful partner in all fighting occasions, it does not seem wise to credit them with a high percentage of results in

their attacks until we are sure that variable weather and such widely differing factors as night and day, shape of the ground, antiaircraft defense, and the nature of the target will not upset our calculations.

This point has been apparent more than once in Italy where the factors mentioned are generally against the attacking air force. The bottlenecks have never been closed for long and hostile troops, with efficient engineer services, do not seem to be delayed for any appreciable time. A similar impression was obtained during Rommel's retreat in North Africa; he always got through and soon was ready to fight again. The same happened in Tunisia. The point is that, while air force help in these ways is obviously invaluable, it seems commanders by sea, land, and air must learn to deduce with accuracy from the experience of the last two years the actual value likely to accrue from any air attack and to allow for that value, no more, but perhaps a little less, in their plans.

A further thought from the battle of Salerno arises out of the fire cover given to the troops from the sea and air during the great German counterattack at the Sele River on the 12th to the 14th of September. At the height of this counterattack, made by the 15th, 16th, and the Herman Goering Panzer Divisions, the situation became somewhat serious though never critical. Our fighter planes were at a disadvantage as their nearest airdrome, Taranto, was 130 miles away; but when the enemy put in masses of Tiger tanks and forced us out of Eboli, not only did the whole of the Strategic Air Force take on a tactical role, but also the Navy brought battleships, cruisers, destroyers, and monitors to plaster the German advance. This combined naval and air assault against the columns forcing their way forward over very intricate ground, broke up the attacks and caused the enemy to call off any further serious resistance to the landing operations. In fact, on the 16th of September, the Fifth Army, showing wonderful spirit and resilience, counterattacked fiercely, and on the 17th of September, the Germans, beaten in front and with their left flank threatened by the rapid advance of the Eighth Army, began a hasty retreat.

A few tactical points of interest arising out of the Salerno landing may here be enumerated. It will be remembered that the landing began at 0400 hours, in darkness.

*a.* The need for adequate guiding lights to beaches was demonstrated.

*b.* A strong force of antitank guns was landed very early. It performed yeoman service.

*c.* The precautions for dealing with mines on beaches and exits do not seem to have been wholly satisfactory in some instances.

*d.* Traffic control to prevent columns jamming up on unexpectedly narrow roads was not always effective.

*e.* Some kind of close artillery support that could be called upon during the landing seems to have been needed; e.g., some 88-mm guns near the beaches had an entirely undisturbed picnic for far too long.

*f.* In difficult conditions for driving, more wire roadway would have obviated some delays and confusion.

On the whole, however, in the conditions of darkness and hostile fire, the troops and their training stood up to the test admirably.

By the 27th of September when the Fifth Army forced the gorges north of Salerno, the battle of Salerno had been won; and so on the 28th of September the next phase, the battle of Naples, began.

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## Tank Operations in Winter

Translated and digested at the Command and General Staff School from a Russian article by Colonel D. Bibergan, Soviet Army, in *Krasnaya Zvezda* 8 January 1944.

WINTER creates unusual conditions for the operation of tanks in wooded and marshy terrain. In the woods the snow is usually deeper than on the plains, and therefore marshes

and small streams freeze more slowly. Sometimes they are even greater obstacles in winter than in summer. This considerably lowers the maneuverability of tanks and makes them dependent on the infantry, and especially on the engineer units. The operations of a tank group south of Nevel illustrates the tactics of a tank group under such conditions.

This tank group was ordered to break through the German defenses and, in cooperation with the infantry, to cut the highway and the railroad between Vitebsk and Nevel. Then, advancing along these lines of communications, the tanks were to join the troops advancing to the northeast. When the order was received, the tank group had already concentrated in the assembly area located from seven to eight kilometers from the highway and the railroad.

The terrain suggested two possible decisions: First, to proceed southward for ten or fifteen kilometers, then turn west and come out on the road. The terrain here was generally open, i.e., quite suitable for tanks. But such open sectors are usually covered by the fire of all types of weapons. The tanks, traveling at high speed, would probably break through a dense artillery and mortar barrage, but the infantry, which possesses a much lower mobility, would not be able to do it. But, in order to seize and hold important lines of communications, both the infantry and artillery would have to follow the tanks through the breaches made by the latter. It is extremely difficult, however, to accomplish such a maneuver in open terrain.

The second possibility was to advance through the woods, i.e., over the streams and marshes which had just been frozen over. This was not quite suitable for the tanks as their maneuverability would be considerably decreased. On the other hand, it would be more difficult for the enemy to use his fires effectively. That meant that the infantry and the tanks could get through together. This would take more time, and uninterrupted "bumper to bumper" contact would have to be maintained. The nearest objective was not too far away. The enemy, least of all, expected the use of massed tanks in this area. That is why the above plan was chosen.

The first stage of the advance was extremely difficult. This was due to the fact that the forward edge of the German defense passed within seventy to eighty meters of the river which the tanks had to cross. The number of crossings to be built had to be decided upon. If the construction of five or six bridges had been undertaken, the enemy would have guessed the direction of the main attack. To conceal our intentions it was decided to build only two bridges. Their length did not exceed fifty meters. Thrice the enemy destroyed the bridges by his artillery fire. Thanks to the precise organization of the work, however, and the determination of the sappers who worked in icy water up to their chests under enemy fire, the bridges were ready by 1600.

A small group of tanks with infantry and artillery immediately crossed over and established a bridgehead on the opposite bank of the river. The main tank forces remained on our side. The enemy, apparently, thought that this was the beginning of a typical engagement for the improvement of position. He did not take any measures against the units on his side of the river, but began feverishly to regroup his troops.

Shortly after midnight, the tank group, unexpectedly for the Germans, began crossing the river. Within a short period of time all the tanks were on the opposite bank, and at dawn, the enemy, who had done nothing to liquidate the bridgehead, was attacked by the entire tank group. His line of defense was broken in a number of places. In groups of two and three, the tanks moved in the direction of the highway and after some time seized several kilometers of it. Several small tank units reached the railroad on the heels of the retreating Germans.

Thus ended the first phase of the breakthrough. Now the wedge had to be widened and this was done in a short time by the infantry and artillery supporting the tanks. Advancing with its right flank against a lake, the infantry covered seven or eight kilometers, occupied an important defile between two lakes

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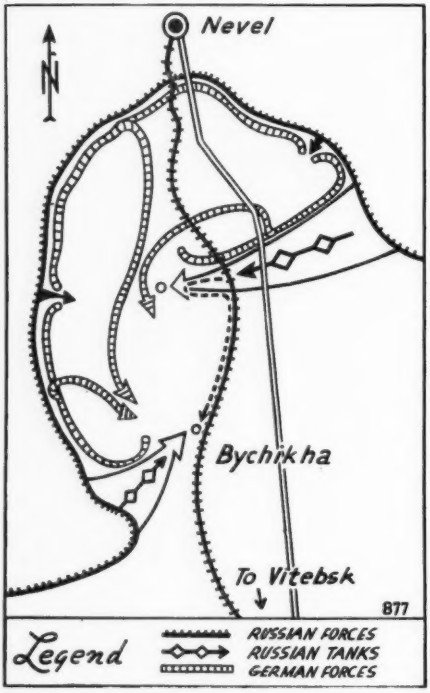
and thereby secured the right flank from sudden enemy attacks.

Inasmuch as the rear of a tank unit must rely on a solid base, it was necessary to force the wedge farther west. The tankmen removed the mines which had been scattered along the highway and the railroad, reconnoitered and marked more advantageous routes through the woods, and moved on the following day.




Having covered from eight to ten kilometers through marshy land, they occupied an important populated place. The infantry moved behind the tanks.

By this time the situation was quite unusual (see sketch). The Germans made several attempts to break through our lines to the south, along the shortest route, i.e., along the highway and the railroad. The wedge driven in by the tank unit was so solid that all their attempts failed. The roads still in the possession of the enemy (north of the wedge) were about to be cut. This was quite probable since, south of the wedge and almost parallel to it, another group of our troops was attacking the enemy, forming, so to speak, another ring of encirclement. Sensing a serious threat, the Germans began to roll southward in great haste, through the corridor which had not been cut as yet.

The tank group advancing to the west could have attempted to close the first ring of encirclement. But the forests with large marshes not yet frozen over would have made the advance extremely difficult. In order to pass through the forest, it would have been necessary to spend much time constructing corduroy and track roads, which become unusable after a few tanks have passed over and hence have to be repaired. Another road for wheeled vehicles carrying ammunition and fuel was needed. Preliminary estimates showed clearly that under these conditions the tanks would be unable to get through and cut the road in this direction.

In the meantime, the reconnaissance had uncovered the following important detail. South of our wedge, half-way to the station Bychikha, the enemy was trying to establish a number of centers of resistance in the hills of that area. He had concentrated there tens of artillery and mortar batteries, tanks, and self-propelled guns. There also were the headquarters directing the operations of their northern group. In order not to allow the enemy to fortify this intermediate position, the tank troop hastily turned back and sped southward along the railroad (broken line in sketch).

Moving along two parallel routes, the tanks shortly came upon marshes. To build here a road would have taken nearly twenty-four hours. But to delay for such a long time would have enabled the enemy to gain time. Then all resources were mobilized. All the men, from truck drivers to unit commanders, worked up to their knees in mud all night and without sufficient tools. Toward dawn, the enemy had uncovered this suspicious activity and began to shell the entire area. But it was too late. By 0600, the road through the marshes had

been built, and tanks attacked the German center of resistance from two sides. One of our tank units with its attached infantry killed over 2,000 German soldiers and captured nearly twenty guns and many mortars and machine guns.

The Germans, abandoning their weapons and equipment, ran in panic through the narrowing salient to the south. The German command attempted to halt near Bychikha. The enemy's center of resistance was again overcome by a simultaneous tank blow from two sides. One group pressed the Germans from the east near the highway and the railroad, drawing on itself a great part of the enemy's fire means. The other group of tanks broke through the woods and marshes to Bychikha from the north and united there with the southern group of the attacking troops. Now the German resistance was broken.

Thus, our tank group, in a comparatively short period, seized from fifty to sixty kilometers of the road which passed mostly through wooded and marshy country.

The complete rout of the German concentration was caused by the skilful maneuver of the tanks. The German concentration fell apart simultaneously in two parallel directions. This enabled the tankmen to operate without endangering their open left flank. Of great importance was the fact that the tank group had switched in time to parallel pursuit. It hung as a constant threat to the flanks of the retreating enemy, transforming, in the end, his withdrawal into a panicky retreat.

The above operation allows us to make the following conclusions. Operations of large tank units are entirely possible even in wooded and marshy terrain. Such operations will be sufficiently effective if a necessary number of engineer units are attached to tank units: at least two or three times more than the usual engineer complement. Infantry and ski detachments have to follow closely behind the tanks. In some cases, when woods and marshes are extremely difficult to pass through, these detachments should march ahead of the tanks in order to cover by their fire the building of the roads. The ski detachments should also secure the necessary information of the enemy and terrain for the tank commanders. In short, the main weight of tank reconnaissance will be on the infantry units which are attached to the tanks even before the battle.

Thus, tank groups are quite capable of conducting large-scale operations even in wooded and marshy terrain. To do this tank routes should be correctly determined and roads quickly built; tank attacks should be alternated with those by the infantry and, in doing so, flank attacks should be combined with energetic pursuit.

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## Street Fighting—The Lessons of Stalingrad

Digested at the Command and General Staff School from an article in *An Cosantóir* (Eire) March 1944, reprinted from *The Epic Story of Stalingrad* by Lieutenant General V. I. Chuykov, Commander of 62d Soviet Army (Hutchinson & Co., London).

THE MEN of Stalingrad were called upon to make a major contribution to the military art of urban defense.

The struggle for the city of Stalin, the stronghold of the Volga, taught us much and greatly enriched our store of tactical experience. One of the most important lessons we learned at Stalingrad relates to Commando action in cities.

The defenders of Stalingrad created shock groups of a peculiar type as an instrument for street fighting. These groups, flexible, maneuverable, very strongly armed, are equally valuable in active defense and in attack.

They are unlike the usual shock groups. In field conditions shock troops approach enemy blockhouses or firing points in order to destroy them completely. Inside a city, on the

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other hand, the shock group is required not merely to destroy the enemy, but to use the conquered strongpoint for its own purposes, to turn it into a reliable strongpoint, into a fort which can be used for a further development of active operations.

The thrusts of the shock groups are short, their actions bold and rapid.

The very nature of urban fighting determines the nature of these shock groups. All street fighting is at close quarters. An offensive inside a city consists in the storming of fortified houses and other structures which the enemy has turned into firing points, strongpoints, or centers of resistance.

Here there is no opportunity for offensive operations by large units, conducted under usual field conditions. Here it is the small infantry group that dominates the scene. The small infantry group is best adapted for taking single buildings or blocks of buildings from the enemy step by step, i.e., for liquidating firing points or centers of resistance.

Thus, it is a small group which is the spearhead of attack in urban fighting.

The first stage of urban fighting arises when the enemy has only just seized a section of a city, and his defenses are still split up. At this stage a small group may operate independently without immediate organic contact with a larger group to which it belongs.

The second stage of urban fighting arises when the enemy has settled down in the city, has been there two or three months, and has established an unbroken line of defenses hanging well together and secured by serious technical works and sufficiently developed fire network.

Even in this complicated stage of urban fighting, the shock group still remains numerically small, and the character of its operations, i.e., its job, is still the same. But in these conditions the group acts only as a spearhead of a larger unit striking a strong blow planned to the last detail.

The experience of active operation at Stalingrad taught us that if it is to fulfil its task, an attacking unit must detail:

1. Storm groups proper.
2. Reinforcement groups.
3. Reserves.

These three battle teams, all tuned to fulfil the same common tasks, form the shock group.

The number of fighting men in each group cannot be stated as a hard-and-fast principle; it must be left to each commander to decide, after he has studied the enemy's fire power, fire system, and garrison strength. But the peculiar tasks of each component of the group need to be fully understood. These can be stated very precisely, and if they are not understood it is impossible to understand the tactics of the intra-urban assault as a whole.

The actual storm groups are the basis of the whole shock group. Numerically they are not large, consisting of about six to eight men each.

They are the first to force their way into the house or other buildings. They rush in, in most cases from various points of their initial position.

Each group has its specific task.

The storm groups fight inside the objective, destroy the enemy, and go through the whole building, each group in the section allotted to it.

They are lightly armed. Their weapons are the grenade, the tommy gun, the dagger, and the shovel. The latter is used like an axe in hand-to-hand fighting.

The groups have a common commander who has at his disposal signal rockets, flares, and sometimes a telephone.

The reinforcement groups also enter the buildings from various directions. They advance in the wake of the storm troops, as soon as the commander of the latter signals "I am inside."

The rocket goes up, indicating that the storm groups have entered the objective. The reinforcement group rushes into the building, occupies the firing points and establishes new ones, creates a fire system of its own directed towards the enemy, and cuts across all the enemy's attempts to come to the aid of his garrison.

The reinforcement groups are heavily armed. They carry light and heavy machine guns, antitank rifles, mortars, antitank can-

non, crowbars, picks, and explosive charges. They necessarily include sappers and other men equipped with the most effective means of destroying the enemy.

The reinforcement group is subordinate to the commander of the storm group.

The reserves are used to strengthen the storm groups, to ward off lateral counter-attacks by the enemy, and also, in case of necessity, as a blocking group. New additional storm groups can quickly be formed from these reserves.

There should be no special, permanent storm groups in the subdivisions. Every Red Army man should be capable of acting in a storm group. Platoons, sections, and companies should be trained in this maneuver just as they are trained in any other infantry maneuver. What is more, it is extremely important that any storm group should be recruited from the personnel of a single unit.

Speed and surprise are the two factors on which the maneuver of the shock groups is based. These two factors are inseparable.

Every commander who is given the job of storming an enemy strongpoint or center of resistance must above all make use of the time factor and the surprise factor.

Both factors merge in hand-to-hand fighting.

"Get near your enemy." The shock group is a product of hand-to-hand fighting. Its indispensable weapon is the grenade. The grenade dictates the distance of the storm—the nearer the enemy, the better.

If we consider from this point of view the more or less important storming operations carried out by our troops, we find that they consist, above all, of persistent, concealed progress, aimed at bringing the attackers to close quarters with the enemy.

The lesson of experience is that the enemy should be approached through trenches or by crawling along, using shell holes and ruins as cover.

Such trenches must be dug at night and camouflaged. The men must gather for the storm rush without being seen by the enemy, without noise, through trenches, in shell holes and ruins. Tommy gun round the neck, ten grenades within easy reach, boldness in the heart. Now act! If you do thus, speed and surprise will both be yours.

However heroic a shock group may be, if the operation is not well prepared the commander will hope in vain for success. The storm must be most carefully prepared and most accurately calculated. Preparations are based on two things: study of the objective and elaboration of the storm plan.

The study of the objective must provide a complete picture of the enemy's firing points and fire system. It must produce complete familiarity with the roads of approach and enable the commander to estimate the best time for the storm. Reconnaissance must also give information on the nature of the defenses, the thickness of walls and obstacles, the position of entrances, concealed loopholes, and ways of communication, on the directional sectors covered by enemy fire, on the obstacles in front of the strongpoint and on the position of the firing point of neighboring strongpoints which can keep the approaches under flanking fire.

If necessary the information supplied by reconnaissance must be checked up by battle patrols.

Plans for a storm must be worked out on the basis of a thorough study of the objective: careful reconnaissance will help the commander to solve his six main problems, which are:

*1.* Composition and structure of the storm groups.

*2.* Composition of the reinforcement groups.

*3.* The extent of reserves.

*4.* The task of the groups at all stages of the battle.

*5.* The degree to which the attack should be supported by fire from the rear, cut-off fire.

*6.* Signals and communications.

The tactics of a shock group must be flexible. Speed, drive, great initiative, and boldness are demanded of every man, if for no other reason than that all sorts of unexpected things are bound to turn up.

Hurry up, be on time, look sharp!

The fighting man finds himself in a laby-

rinth of rooms and foxholes, all full of danger. Never mind. Chuck a grenade in every corner. Go on. Put a tommy-gun burst into the remains of the ceilings; if that is not enough, then a grenade and forward again. The next room—another grenade. Comb it out with the tommy gun.

Never dawdle!

Inside the objective the enemy may try to counterattack. He knows how to fight as well as you. Don't be afraid. You have already taken the initiative and it is in your hands. Storm more fiercely, use your grenades, your tommy gun; then go for the dazed enemy with dagger or shovel.

Fighting inside a house is savage fighting. Blind your enemy by every means and then hit him out of the darkness. Be prepared for surprises.

The reinforcement groups have worked out their own tactical methods, which have passed the severest tests. These methods include the careful consideration of every trifle as well as the major problems.

*1.* Machine gunners, mortar gunners, number one's of antitank rifle crews force their way into the building. Their number two's follow them, carrying ammunition and food for twenty-four hours of battle.

*2.* Having forced their way in, they must immediately seize the upper or middle floors of the objective, in order to keep the surrounding terrain under fire and prevent the bringing up of enemy reserves.

*3.* Having occupied and established firing points in the building, supplementary firing points must first be established outside the building on the flanks, and then moved forward towards the enemy, in order to come to close quarters as a prelude to further active operations. This is most important. A house is, after all, more suitable for peaceful living than for battle operations, and especially offensive operations.

Don't stay put in a house. Immediately begin again to establish routes of communication, new blocks and trenches. Work your way persistently nearer to the enemy.

Commanders and men are working diligently to solve the tactical problems involved in mutual cooperation between shock groups and artillery, tanks, and other arms. At present the position is quite definitely this: if the enemy's fire power is concentrated only inside a building or other objective which he has transformed into a strongpoint or center of resistance, the storm must be sudden, without artillery preparation. In such circumstances, artillery preparation would have no effect.

Nevertheless artillery must be brought into action in the course of the storm. Small-caliber guns, supported by antitank rifles brought forward at night or behind a smoke screen after detailed reconnaissance, can effectively belabor the enemy's firing points. These guns, moved forward suddenly to a previously chosen position should give cut-off fire and paralyze the enemy's attempts to assist the garrison of the objective to be stormed.

Skilful support of the shock group by tanks, which fire pointblank at the loopholes or undermine buildings by their fire, considerably increases the force of the attack.

Some commanders have raised the point: "Darkness or smoke-screen?"

Our answer is: "Both." The important thing is that during operations under cover of darkness or behind a smoke screen, the commander should be sure to keep the directing of the battle in his grasp. That is the essential problem.

Underground mine attacks are undertaken if an approach to the objective by other means would entail unnecessary losses. Our shock troops are employing this method with increasing frequency. There is only one thing to be said: "Be daring."

The sapper is an important figure in street fighting. His place in the shock group is a place of honor.

Such, approximately, are the tactical problems, relating to the operations of storming groups. They are born of the basic factors of all fighting: speed and surprise.

It is wrong to think that urban fighting in every case is, in the literal sense of the word, street fighting. When the enemy has entrenched himself in a town, urban fighting means fighting for a house, for a building,

for a block. Operations develop along alleyways, inside houses, in ruins, underground.

But the streets are empty and so are the squares.

New tactical methods for shock groups are born in the actual course of urban fighting. The shock group and its maneuvers are themselves the creation of multitudes of fighting men and commanders who are ardently devoted to their country and who hate the enemy with a bitter hatred.

Each commander should be on the watch for new ideas and take careful note of them. Training for initiative and daring is the first thing we must cultivate in order to develop incessantly the formidable power of the shock group.

Here a straight road leads to the individual fighting man.

He must be bold and full of initiative, he must be confident in his own strength. No one but he can do the job allotted to him in any operation, for each man has his own accurately formulated job to do. Each man must know exactly from where he will be catapulted into action, by what ways he will force an entry into the objective, what he has to do and where and how he has to do it once he gets there.

Inside the objective the man is left to his own devices for an unspecified time. He has to take his own decisions. That is what he must be trained to do.

So that he may not be repressed, so that he may act, not wait and see, he must be told: "Here, during the fight in the house, no one will give you any instructions. You've got your job to do. No one is going to lead you about on a leash in these circumstances. Your rule is—action!"

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## Breakthrough Tanks in Action

Translated for the Command and General Staff School from a Russian article by Lieutenant General V. Volsky, Armored Force, Soviet Army, in *Krasnaya Zvezda* 23 June 1943.

THE period of the rushing of masses of tanks into a breakthrough is preceded by a methodical "gnawing" at the whole tactical depth of the enemy defenses. As a rule, this "gnawing" is carried out by the breakthrough tanks in close cooperation with infantry, artillery, and aviation. Before discussing the basic principles governing this cooperation, it should be noted that the breakthrough tanks are ordinary combat vehicles, primarily heavy tanks. Because of their powerful weapons, armor, and excellent maneuverability, these machines are more suitable than other types of tanks for breaching fortified zones of enemy defenses.

What are the basic problems facing tanks and infantry cooperating in a breakthrough operation? It is generally known that artillery is the worst enemy of the tank. Conversely, infantry losses result mainly from rifle, machine-gun, and mortar fire. Consequently, the tanks, in order to advance, should sweep away with their fire and tracks not only artillery and personnel but also enemy machine guns, mortars, etc., while the infantry, in addition to its mission of destroying machine guns and mortars, must assist the tanks by destroying enemy artillery. Thus, tanks and infantry, while fulfilling their own specific tasks, help each other in executing their respective missions. Their operations are aimed at one objective —the breaking up and destruction of the enemy's entire defense system. This is quite logical. Artillery is the foundation upon which any defense must rest. As soon as this foundation begins to crumble under the blows of heavy tanks, artillery, and airplanes, the defense system loses its strength to a large extent, and it becomes easier for the advancing infantry to effect a breakthrough. The more carefully a breakthrough is prepared, the quicker it can be carried out.

Here are a few general remarks concern-

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ing the role of tanks and the methods of using them in a breakthrough of German defenses. Breakthrough tanks may be formed in several echelons, which agrees with the principle of massed employment of shock troops. Tanks should never be thrown into battle in small groups at definite intervals of time and space in the hope of building up the force of the blow. In that case, instead of a sharp crushing blow paralyzing the whole enemy defense system, the tanks deliver only a few ineffectual jabs. By entering the battlefield in small groups, the tanks simply facilitate the task of the enemy antitank artillery. Nor should tanks be used even *en masse* without infantry support.

When the objective is the carving out of a corridor in an enemy defense zone, through which our massed tanks and infantry are to pour into the depth of enemy-occupied territory, it should not be attempted to drive through and past the network of strongpoints and artillery batteries, but to clear the whole corridor area of the enemy manpower and weapons. Only in this way will it be possible to insure a planned and unhindered passage of the troops assigned to the exploitation of the breakthrough. The final mopping up of the corridor cannot be accomplished by tank units only, no matter how strong they are. Their blow must be supported by automatic rifles, grenades, and rifle butts. Only then will the enemy resistance be suppressed in every fold of the terrain and in every pillbox and trench.

These preliminary observations reveal the principles underlying the cooperation among tanks, artillery, infantry, and aviation in a breakthrough. Success depends largely upon the thoroughness of the preparations. During the preparatory period, the commander of the force of all arms and the tank unit commander carry out a thorough reconnaissance of the enemy's forces, study his system of fire, and carefully reconnoiter the terrain, which is particularly important for tanks. The nature of the terrain determines its suitability for tank movements, even in the case of heavy tanks. It happened many a time that even a narrow but previously undiscovered swamp area in the depth of the enemy defenses broke up battle formations of tanks and even led to the collapse of an otherwise carefully prepared attack.

Therefore, each tank commander and the infantry and artillery commanders cooperating in breakthrough operations conduct a joint reconnaissance of the terrain and defense areas of the enemy. It is very important that the commanders be supplied with aerial photographs of the enemy defense zone before the battle is joined. It is also desirable that just prior to the beginning of decisive operations the commander of the force of all arms and the tank unit commander personally look over the area selected for the breakthrough, from a plane if possible. These data will, no doubt, provide a sufficiently complete picture of the enemy defense system and make it possible to work out effective methods to overcome it.

Let us consider a concrete example of how a breakthrough was organized and carried out at a stabilized sector of the front. Although the events took place in winter, the lessons learned are applicable to conditions at any time of the year.

In an army sector, the N-th rifle unit supported by tanks was ordered to break a corridor through the enemy defenses in order that a mechanized formation might be thrown into it. After a thorough study of the German terrain and fire system, a definite plan of attack was worked out. It was decided to make a breakthrough in an enemy sector which had its flanks anchored on two lakes. It seemed at first that the direction for the main blow had been chosen unwisely, but the terrain features turned against the enemy as soon as our tanks and infantry occupied the defile. The Germans could not employ flank artillery fire against the attacking infantry and tanks inasmuch as their artillery fell under the crossfire of the tanks and rifle units.

On the basis of carefully checked data, a time-table of operations [literally, a table of planned operations] was drawn up, which included time and place for fires and ma-

neuvers of various units. Here we shall consider only the most important events of the battle.

Prior to the attack, the enemy mine fields were subjected to artillery shelling and bombing from the air. This exploded many of the mines and made the field fairly harmless. At night, our advanced edge was marked by light signals in order that our infantry might not be hit. This permitted our airplanes to continue the neutralization of the enemy mine fields and to wear out the enemy physically and mentally.

In the morning, after reconnaissance by various infantry units, the artillery preparation began. The enemy defenses were divided into two zones. First our artillery opened a crushing fire on the nearest zone and continued it for over an hour until a large majority of the previously surveyed targets were destroyed; then this zone was heavily bombed from the air. As soon as the bombardment ended, infantry and tanks moved ahead. Artillery and aviation transferred their blows to the second zone.

As a result of the massed and well coordinated blows by artillery and aviation, the enemy was badly mauled and unable to offer any prolonged resistance. One by one, the enemy firing positions were destroyed by the advancing tanks, and our artillery transferred its fire to the next line of defense. The moment for the decisive blow was approaching. Then the automatic rifle detachment carried by the tanks was speedily moved ahead. Simultaneously, in order to pin the Germans down, two shock groups of infantry went around the lakes and attacked the enemy from the flanks, threatening the German artillery with capture. As a result, the Germans were put to flight.

The final infantry reconnaissance to disclose the enemy system of fire preceded the main operation of punching a corridor through the enemy defenses. It began at dawn, and soon our command was thoroughly convinced that the fire system had not been changed and that most of the enemy artillery and mortars occupied their original positions. This indicated that the enemy did not suspect the impending threat—a condition which allowed us to act with surprise and certainty.

Then came the decisive blow by all arms upon the enemy defenses. The tank units were moved in in three echelons. Supported by infantry, they entered the area of German defenses and subjected it to intensive fire. From that time on most of the German defense was in effect paralyzed. Although our tanks were deeply echeloned, their fires were properly coordinated, and this was one of the reasons for the speedy collapse of the enemy strongpoints.

An important part was played by the automatic rifle detachments carried by tanks. As soon as it became clear that the German defenses were crumbling all the way to the rear, these detachments rushed ahead of their tanks. They occupied positions near road junctions in gulleys and hamlets and formed numerous islands of resistance within the enemy defenses. The Germans were confronted with a very complicated and dangerous situation. The automatic rifle detachments started firing along the front, and their fire had the effect of immobile screens of fire [literal translation], splitting the enemy defenses into separate sectors and cutting off their escape routes. Soon the German strongpoints were safely isolated and one after another lost contact with their centralized system of control. Their fire showed signs of panic. Separated from each other tactically and lacking fire support, they were successively destroyed by our infantry and tanks.

Our tank losses were insignificant, because all tank maneuvers were executed as swiftly as the terrain permitted. This once more gave practical confirmation to the belief that a good half of the striking power of tanks lies in the swiftness of their actions. The personnel of breakthrough tanks, who often fight for hours within an extremely small area, must master to perfection the art of bold battle maneuver.

In this breakthrough, the artillery supported the tanks and infantry very intensely. Its fires were massed, and therefore very ef-

fective. When our infantry and tanks invaded the battlefield, the artillery moved its fire ahead. Thereafter its fire was transferred by hops from one parallel line of defensive positions to another. How close the line of our exploding shells should be to the breakthrough tanks is a question of great tactical importance. Not very long ago many troop and tank commanders considered it ideal for the advancing tanks to operate at a distance of 150 to 200 meters from the barrage. My combat experience, however, shows that it is not really advisable, because the tanks lose—and this is very important—the freedom of maneuver. The distance between the tanks and the artillery barrage should be sufficient to insure freedom of maneuver and continuous observation of the terrain. Tank formations should include self-propelled guns which fire through openings between the tanks and help them finish off the remaining enemy firing positions.

The first echelon of breakthrough tanks should also carry qualified artillery observers. Without distracting the tank commander from his duties, they transmit coded messages for the opening, concentration, or transfer of artillery fire upon the enemy lines and strongpoints, and the most stubborn machine-gun nests. It is desirable that the tank, acting as an armored and mobile artillery observation post, be under the control of the artillery officer at critical moments. This will fully utilize the effectiveness of artillery fire and will add elasticity to its control at all stages of the breakthrough.

What should be the minimum width of the breakthrough corridor? Battle experience shows that it should be at least six to eight kilometers wide. If it is any narrower, the enemy will cover it with machine-gun, mortar, and artillery fire, and not infrequently such fire concentration is so intense that our infantry and artillery have difficulties in overcoming it.

What will the breakthrough tanks, infantry, and artillery do when a corridor is punched through the enemy defenses? It is obvious that by this time they will have solved only the first half of the problem; they cannot merely stand by and watch the entrance of mechanized and motorized masses into the breakthrough. Since the enemy usually attempts to close or narrow the corridor, they should direct all their effort toward retaining and expanding the breakthrough area. Two methods may be used to achieve this end.

The first, which is used most often, consists of throwing back the enemy by a series of strokes delivered by strong groups of tanks and infantry at alternating points along the walls of the corridor. The second method, although used less frequently, is all the more effective at this stage of the battle. Sufficiently strong screening detachments of infantry and artillery are placed along the walls of the corridor. The remaining forces, including all the tanks, split into two powerful groups and encircle the enemy units on both sides of the corridor. They strike at the enemy flanks or rear and create a real threat of encirclement. As a general rule, the enemy cannot withstand this pressure and breaks into flight. The speedy and bold actions of such shock groups can inflict heavy losses on the enemy and widen the corridor within a short time.

Here are a few remarks concerning the start and duration of breakthrough operations. It is best to start out early in the morning, or at least before noon. The breakthrough itself should be completed within a few hours and before darkness. Under no circumstances should the continuation of the breakthrough be postponed until the following day, because during the night the Germans can patch up their defenses with such strong forces of artillery, infantry, and other units that by morning their defense in this area may reach its former strength or even surpass it. Thus the success of gaining some ground the day before would amount to simply a dent in the battle formations of the enemy. If this happens, still further effort will be required for the completion of the breakthrough, and under certain circumstances it may be inadvisable to continue the effort in the same direction.

In organizing a breakthrough, the commander of troops should provide an umbrella of fighter planes for the advancing troops. In places where such an umbrella was created skilfully, the enemy did not risk employing his bomber planes, and as a rule the process of "gnawing" through his defenses strictly followed the original plan.

A strong reserve force of tanks at the disposal of the commander is also desirable. When the tempo of the offensive slackens or if the enemy brings up reinforcements, the tank reserves help beat off counterattacks and accelerate the rate of our advance.

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## Work of Soviet Agitators in Offensive Operations

Translated and digested at the Command and General Staff School from a Russian article by Colonel I. Shlyapin in *Krasnaya Zvezda* 1 March 1944.

*This article, written by Colonel I. Shlyapin, Chief, Agitation and Propaganda Branch, Red Army General Staff, is published for two reasons; first to bring out the magnitude of the morale-building effort of the Soviet command, and second, to acquaint the readers with little known and generally misunderstood activities of the political commissars and political sections.—THE EDITOR.*

WE knew of the stubborn battles to come and of the difficulties of breaching the iron walls of the German defenses. The troops went through a series of long and arduous preparations. So did we—the political workers of the N-th Army.

We realized that the work of agitators on the battlefield had been unsatisfactory in the past, and that our usual meetings, talks, and other activities had always been almost entirely discontinued with the start of offensive operations.

To correct this fault, the necessity of stepping up the activities of political workers was brought to the attention of all commanders, their political assistants, chiefs of political organs, party organizations, and the agitators.

All our agitators went through special seminars where all methods and phases of their work were thoroughly covered and much attention was given to various forms of oral and printed agitation best adapted for offensive operations.

This work has played an important part in the successes of our army. The divisions and regiments have fought uninterrupted offensive battles for months, and the work of our agitators has not stopped even for a day. Besides, in the course of the battles, new methods of influencing the men have been developed.

One of the most effective methods is the use of special printed forms bearing the picture of a Red Army soldier with his bayonet thrust into the body of a Fascist and a message which reads as follows: "Comrade: During the course of the battle, describe the heroic deeds of the men and officers of your unit, then pass the cards down the line." Thirteen thousand of these cards were used up in less than fifteen days.

These cards are very popular among our fighters. The cards which have been used are worn out, wrinkled, and dirty. They have gone through many hands. One card describing the work of a machine gunner bore an additional inscription in an uneven handwriting: "That's the boy, Vanya! Bet you I can do better than that."

Another effective method is the sending of special congratulatory cards to outstanding men and officers. The cards are attractive and printed on good paper. Sent out by company, battalion, and regimental commanders, they read something like this: "To Sergeant Ivanov: Your action in the engagement for the possession of Hill 650 is highly valued by the commander. You have been awarded the medal 'For Courage.' Congratulations." Other cards contain messages of this type: "To Sergeant Petrov:Thanks for the excel-

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lent firing and the destruction of the strongpoint. Your action has contributed to the success of the infantry attack. Regimental Commander ————."

The receipt of such cards is looked upon as a sort of award. It is satisfying to realize that one's work has been noticed and appreciated. This gives the man added strength and new energy. Such congratulatory cards from commanders are the subject of pride for both officers and enlisted men.

Meetings are now held much more often. As a rule, they are called whenever a battalion or a company has a difficult mission to accomplish. Such meetings are short; not more than two or three speakers participate, but the effect of these meetings upon the morale of the men is far-reaching.

In one of our tank regiments, a letter just received by one of the sergeants was read during such a meeting. The letter told of the death of the sergeant's mother during an air raid on Leningrad. The tankmen were visibly touched by the sorrow of their pal and went into the battle with a slogan conspicuously painted on the head tank; the slogan was: "Revenge for the Victims of Leningrad."

Since the very beginning of the present offensive, all efforts of our agitators have been directed to maintaining in our men the unwavering will to go forward, and it should be admitted that the success of our troops has been due to a considerable extent to the activities of our agitators.

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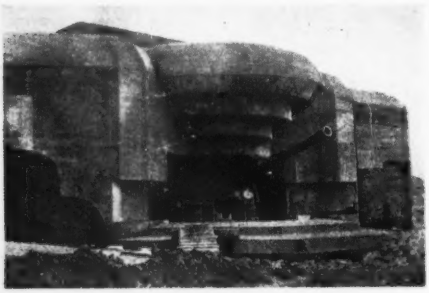
# The Armored Coast

Translated at the Command and General Staff School from a German article by 1st Lieutenant W. Köhler in *Die Wehrmacht* 8 March 1944.

IN THE course of history, invasions have been repeatedly made. The Hundred Years War of England against France was an invasion that, from the point of view of shores, was unbounded. Likewise, Great Britain has made her colonial acquisitions by the aid of amphibian operations. In the period of the first World War, the landings at Gallipoli and Saloniki were indeed successful, but the initial success could not be expanded into an invasion. In this second World War, the Japanese can look back on a series of landings and invasions which gave them strategically important key positions in the South Pacific. Also, the invasion of Norway by our armed forces in the spring of 1940 was an invasion operation that filled us with just pride.

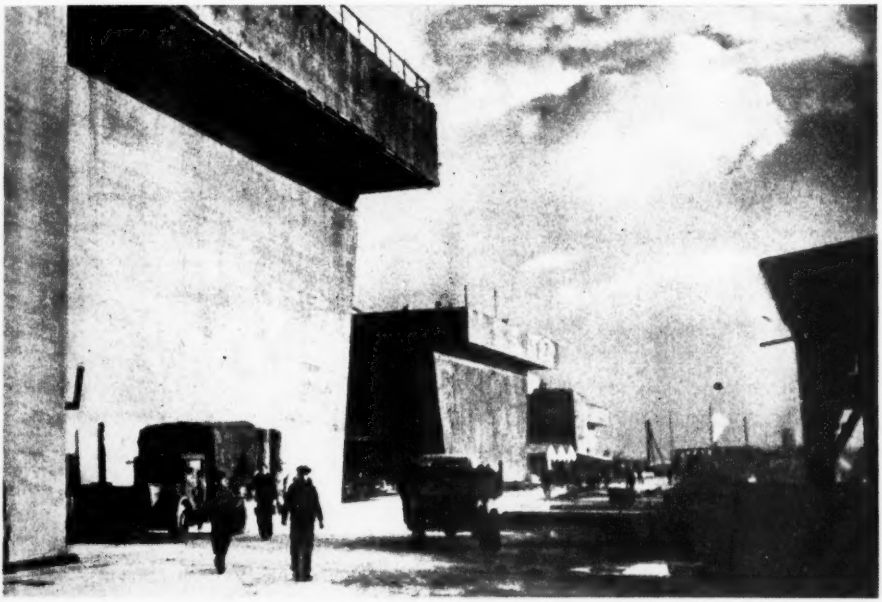


A GERMAN COAST ARTILLERY BUNKER OF A TYPE FREQUENTLY PICTURED IN THE NEWSPAPERS AND MAGAZINES OF THE REICH. (FROM "WOCHANSCHAU," ESSEN, GERMANY).

We know that the enemy—since all other means have failed—now plans to reach a decisive turn in this war by means of an invasion which would necessarily lead to a direct attack on the vital centers of the nation. We counted on this development at an early stage, and for this reason the coasts which are occupied by us, as is well known, have been fortified in the most modern manner.

Naval forces have charge of the security of the sea front. Light naval units, patrol boats, mine-locating boats, and submarine chasers protect the coastal forefield; mine-locating boats and mine sweepers clear the way for our own boats, while extensive minefields make the approach to the coast difficult for hostile war vessels. The harbors are pro-

tected by harbor patrol boats, net barriers, torpedo batteries, and naval artillery. The coast is covered, far into the land, with a network of defense installations of the most modern kind. Places that are especially threatened are filled with antitank walls, wire obstacles, and extensive minefields, between which are found gun emplacements of all sorts: blockhouses several stories in height,



MASSIVE STEEL AND CONCRETE BUNKERS BUILT BY THE GERMANS NEAR THE RUINS OF A FRENCH PORT. THIS "BUNKER-CITY" HOUSES 10,000 MEN IN ADDITION TO MACHINE SHOPS, WAREHOUSES, OFFICES, AND WEAPON EMPLACEMENTS. (FROM "WOCHANSCHAU," ESSEN, GERMANY.)

batteries with armored cupolas which may be raised, with guns of high and flat trajectory, with antiaircraft and antitank guns, with two and four-barreled machine guns, with bombproof command posts, quarters for crews, and storage rooms for ammunition. On the 2,100 kilometer stretch of the channel coast, not less than 9.3 million cubic meters of concrete have been used, and more than 6,000 guns from medium to the heaviest calibers point their barrels toward the enemy. For each ten kilometers of the Channel and Atlantic coast, there are not less than twenty-eight heavy guns of all calibers—which does not include the lighter weapons such as automatic antitank and antiaircraft guns.

If, however, because of unforeseen circumstances, the enemy succeeds in setting foot on the coast and, supported by his naval and air forces, penetrates into the zone of fortifications, he will still be far from having reached his objective. He will then have to provide security for his flow of supplies. He will have to bring in men, matériel, tanks, ammunition, and food by the water route. The defender is able to engage his naval and air forces against this route, to throw his local and sector reserves into the fight, and to press the attacker back in the narrow area occupied by him, as long as he does not yet have sufficient men and matériel at his disposal. But should this thrust also be

parried, the forces which have effected the landing still have ahead of them a fight with the rear installations, the fortified works that are echeloned in depth. All this will require so much time that the defender will be able to bring up his strategic reserves, and, by launching a counterattack according to plan, at least prevent the landing from developing into an invasion. The mobile reserves are composed of troops that have been tried on all fronts and have acquired fighting experience. They are prepared for their task by intensive training. The places where they are stationed are so chosen that they can be transported in the shortest time to the threatened coastal area.

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## Jungle Craft

Digested at the Command and General Staff School from a lecture by Captain H. Peacock, given at the Intelligence School, Karachi, India, and printed in *The Journal of the United Service Institution of India* January 1943.

*NOTE: Captain Peacock's experience covers life as a Forest Officer in Burma, a Forest Surveyor in Rhodesia and Portuguese East Africa, and with the Army in the forests of Ceylon.*

ONE of our first considerations before we wage war in the jungle is that we should learn as much as possible about jungle craft. The best way to bring my points home to you is to go, in imagination, through the successive stages of your preparation and reconnaissance.

*Foresight and Plans.*—First of all, foresight. What are the essentials? Obviously, the study of your map and the consideration of a plan. You must study your map, not cursorily, but so thoroughly that you might almost make a reasonably accurate reproduction from the mental picture you have obtained.

What is the first and most essential item of your preparations? In the desert, I should say: water. In Burma, where there is plenty of water, I should suggest food.

*Food.*—You will be wise to consider those foods which are available, not only in the area you are to reconnoiter, but which are available in your camp. As examples: rice, *dal*, dried beans, flour, dried vegetables. Fruit is rather important: take dried fruit. Dried meat, salt, tea, sugar, chocolate: these are merely examples and you should know what suits you best.

Get accustomed to eating rice, because it is easily obtained in Burma, is quite nourishing and easily carried and cooked. I suggest that one and a half pounds of rations of this sort per day is ample; ten pounds will keep you going easily for a week.

Before you go, consider what forms of food you may obtain from the country you enter. Rice, certainly. Remember to look in on any *Taungyas* on your route where you may obtain fresh pumpkins, marrows, beans, jungle tomatoes, sweet potatoes, and so on. *Taungyas* are patches of temporary cultivation in clearings made by cutting and burning the jungle. Even when deserted for some time, various vegetables may seed themselves and be found in fruit.

There are a great variety of animals, birds, and fish to be shot or snared. It is not difficult to live on the country if you are well prepared and learned in jungle craft. A small roll of fishing line is always useful, and you may have the opportunity to catch fish in some pool.

You require a knife: strong, sharp, and heavy enough to cut such things as bamboos. You will require it also to cut up meat if you kill an animal. Don't forget to dry out any surplus meat. Dried meat is very light and sustaining. Dry out your meat over a fire. It saves time.

Get into the habit of eating two meals a day: morning and evening. A midday meal is unnecessary.

*Drink.*—Good water is available throughout Burma. You may feel happier with some form of sterilizing tablets.

*Health.*—Attention to your health is very important: but the only medicines you need carry are the following:

1. A small field dressing.
2. A little bottle of iodine.
3. A little permanganate of potash for use in the very unlikely event of your being bitten by a snake. Permanganate of potash is also useful for sterilizing water and disinfecting wounds.

*Cold Nights.*—From December to March you will require a blanket. The nights can be very cold. Get into the habit of sleeping with the blanket drawn right over your head. One blanket used in this manner will keep you warmer than two with your head uncovered and your lungs gulping in doses of fresh air.

*Insects.*—Even in the dry weather and in the daytime a variety of mosquitoes, ants, and other insects look you over as soon as you sit down to rest, and, in the case of many people, insect bites become septic. A light mosquito-net, dyed green, is very essential. Rectangular or tent-shaped are better than bell-mouthed nets.

*Clothes.*—I have used ordinary rubber-soled gym shoes for years. You may prefer sandals or *chaplis*, but your footwear must be light: something that can be slipped on and off at every opportunity to allow your feet to remain fresh and dry. You will cross water continually and, in any case, the heavy dews that lie from November to March on all herbage will wet your legs and feet every morning till nine or ten o'clock.

There is an affliction of the feet that the Burmese call *Wesa* or The *We sa*, which literally means: "Eaten by sand." During the early rains in Northern Burma, if you walk for long periods with wet feet and cross sandy streams, you are very likely to find the soles of your feet pocked with holes and finally eaten away, till you are crippled. The remedy is to air and keep your feet as dry as possible.

Be very careful of your feet. Leeches will enter through the eyelets of boots, through stockings, and between the folds of puttees; and you will not know they have entered. Such wrappings round feet and legs are quite useless and in fact, harmful. I like shorts and bare legs but khaki slacks to the ankle are probably better.

The ordinary bush-shirt is far and away the most useful body covering. Have large pockets and use them for carrying most of your impedimenta: the weight is then well distributed and there is little drag on the shoulders. Wear your oldest and floppiest cap or hat.

Collect all your clothes, shoes, and hat and dip them in a bucketful of leaf-green dye. Thereafter blotch them with patches of brown and black, and you will arrive at a very nice and sensible effect. You cannot afford to be seen, and camouflage is as essential in the forest as elsewhere.

*Miscellaneous.*—You will require a haversack to carry your rations and oddments—a small luminous compass; a small electric torch; matches or a petrol lighter; a very small spirit-burner, to be used only when a wood fire cannot be safely made; and any small light articles you may fancy. A very light sheet of oiled silk or cloth may be considered if rain is likely to be encountered.

If you consider this list you will find that, including rifle and rations, you have barely twenty pounds to carry. The temptation to take more is likely to be strong: resist it, because every pound over this weight becomes a burden on a long march.

A well-trained dog may be a most efficient sentry, and even messenger to your base. Carrier pigeons are invaluable aids to scouting parties working far behind enemy lines. Goats are silent, active animals that will follow you through all sorts of country and carry ten pounds of supplies each. You may laugh, but goats are often used for transport: they may also be killed and eaten as a final resort.

*Movement in the Jungle.*—You have completed your plans and preparations and are ready to move. Your base is near some jungle road and all around you is the jungle, seem-

ingly very dense and impenetrable, particularly where the sunlight, striking in on roads and clearings, promotes heavy undergrowth. You must avoid main roads and tracks and move through the forest. You suffer from a feeling of entering a maze. Don't let that disturb you. Consider that in these forests there are many animals as large or larger than yourself and that they make and follow game trails, some of which are many years old. The game trails never run straight: they wind about and criss-cross the jungle; lead to clearings, water-holes, and salt-licks; and small ones may lead into larger ones or merely vanish. Elephant trails are often as wide as bridle-paths. Don't lose your head: use these trails and only strike across the jungle when there is no likelihood of the trail assisting you on your way.

The larger game trails are not purposeless: they follow the easiest ways across hills and rivers and swamps; and near them you will find opportunities to supplement your meat rations.

*Direction.*—Sense of direction is based on a conscious or subconscious (instinctive) plotting of one's course; so that at any and all moments one can point to the direction of the starting point and return to that point by the shortest route. To do it consciously is a great strain; but one finds that, with practice, the subconscious mind begins to take over this function and leaves the conscious mind to attend to other matters. With great practice and experience the subconscious mind takes over entire charge and sense of direction becomes what is called instinctive. At its finest this sense is independent of outside aids, such as the position of the sun, prominent objects, etc.

The compass is an obvious aid; but in practice, in the jungle, the inexperienced man would never be able to move very fast if he had to make constant reference to his compass. It should be used as a last resort and a check.

The shadows thrown by the sun are an easily observed and accurate aid to direction; but one must allow for the gradual displacement of shadows as the sun moves round.

Prominent objects, the course of rivers, prevailing winds, stars and moon are all aids to direction.

Above all do not get flustered if you lose your direction. Sit down and think it out. Climb a tree and study the landscape. Do anything rather than give way to the urge to hurry on at all costs and in any direction—an urge which assails people when they realize they are lost.

At night, in jungle, where constellations are unrecognizable, align any star with any branch or twig and watch the movement of that star. It moves from east to west.

*Halts and Meals.*—Time your movement and halts sensibly. The forest punishes with scratches, bruises, and loss of direction and confidence any attempt at hurried and disorderly movement.

Do not sleep near a track, game trail, stream, or on a ridge. These are jungle highways at night and a tiger might disturb you. Go to the side of a hill away from game tracks, choose a dense thicket, make yourself comfortable, and rest quite easy in mind. The chances of anything finding and disturbing you are remote.

*Cooking at Halts.*—You should try to get outside a decent hot meal at least once a day; preferably at sundown. Give yourself time for this and halt well before dark.

*Rope and String.*—The bark of various trees can be shredded for use as rope and string. The bark of the "Shaw" tree is strongly fibered and particularly useful for this purpose.

*Jungle Fruits.*—Do not count on jungle fruits and berries for food. There are not many and some are poisonous.

*Reading Signs in the Forest.*—Hitherto you have been concerned with the care of your body and precautions against losing sense of direction. There are other considerations, the search for information of enemy positions and movements, observation of ground for military purposes, and such contacts with friendly locals that you may have in mind. How can the jungle help you? In many ways.

Primarily, I would ask you to regard the ground on which you walk as the page of a

book, or the sheet of a newspaper on which is written the news of all activities in and around the jungle. All movements of animals and men are marked by tracks and signs which are there for your interpretation. Go out of your way to study the signs in soft ground, in the beds of streams, on roads and tracks, near water-holes and salt-licks. Movement is seldom purposeless: a few fresh tracks supply information about their maker: his direction and probable purpose. Consider the tracks you see of wild and domesticated animals and of man: their size, their age, their direction, their probable purpose.

Animals fear men and watch them continually. Watch the animals, their tracks, and their behavior and you will learn the whereabouts of men. Listen to their cries and learn to recognize their alarm calls.

Do not disregard birds. A bird such as the lapwing (the "did-you-do-it" bird), found in clearings near camps and villages, invariably gives away movement of men by loud and continuous cries.

The ability to see and interpret tracks and signs can only be fully developed by practice in the field, and there is little advantage in attempting to explain these matters theoretically. My words are merely pointers to a very important section of woodcraft.

*Shooting.*—The correct use of a rifle deserves a few words. In the jungle quick decisions and timing are of far more urgency than mere accuracy. The affliction known as "stag fever" is far more prevalent in the jungle than in open country, where there may be time to exert self-control and shoot calmly and accurately. To fire at the right moment, to know when to hold one's fire, are all-important under conditions where a second shot is most unlikely to be obtained after a miss.

In the jungle, fifty to seventy-five yards is a long shot. Study your rifle and make sure of absolute accuracy at close ranges: and fight against "stag fever," which attacks the most experienced of us.

*Movement and Stalking.*—When a good hunter sees an animal in the jungle without himself being seen, he usually counts it as dead. While he approaches, times his shot, and finally kills, his main anxiety is never to lose sight of his game. So long as he can watch its movements, and especially its head, he can safely move and approach without being seen. He stands motionless if the animal turns in his direction and moves only when it moves or turns away. It follows that his tactics are concerned with obtaining a good field of view and concealment by lack of motion rather than by cover from actual view. Crawling is not necessary in the jungle. A combination of careful, considered movement and absolute stillness when halted is the main requirement.

You may, when alone or with a companion or two, meet a strong enemy force in the jungle. Bear always in mind that you will not be seen so long as you remain motionless; and while you remain unseen you have the advantage of surprise. There is no need to panic. Stand quite still behind cover, and, since men have negligible powers of smell, you will probably be overlooked even at a few yards' distance. But keep your eyes open, and, if you are seen, dash off into heavy cover. The element of surprise will mitigate against any probability of your being fired at and hit. Stop after fifty yards or so and listen for pursuit and then move off quietly. If you are followed by two or three men only, stop and kill and move on. This is not my invention: it is the tactics followed by wild animals, and they are wiser than we in jungle lore and in avoiding observation.

The woods are quiet and all these children of the jungle know that there is grave danger from disorderly and unconsidered movement. Do not violate the sanctuary of the woods by unnecessary noise and hasty movements.

*Jungle Infantry.*—In conclusion, consider the application of this advice to patrols and even greater bodies of infantry, because you may often have to fight for your information. It goes without saying that the men must be well-trained and led and be jungle-minded. In the jungle, movement by bodies of men must be in single file; but they must be ready at all times to deploy and drop noiselessly out of

sight. Their formations must be essentially fluid and every man must be capable, if the need arises, of acting as an individual and being able to support himself.

It is the mental attitude that counts. Let us regard jungle warfare as a game—healthful, thrilling, interesting—and above all regard the jungle as a friend and not as an enemy. As officers, you should be fitter and more alert than your men: able to interest them and train them in the craft of the jungles in which they are to fight. The Japanese come from one of the most highly industrialized countries in the world and can have no natural advantage over you in the jungle.

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## Battle Teamwork

An article by Commandant J. Murray in *An Cosantóir* (Eire) February 1944.

EXAMINING the organization of any army and starting with the smallest unit, we find that eventually we reach the unit that combines all weapons and services. Where the organization brings together two, three, or four battalions as the case may be, this stage in the organization is reached, and we find in it the added arms and services which enables it to function as a team over a protracted period. True, it will depend on base units for supply and evacuation, and on divisional and army controlled equipment, such as bridging or heavy ordnance, but these are all departmental or technical and do not affect the working of the team. As no smaller unit is capable of carrying on protracted operations on its own account, and as protracted operations must be trained for, the teamwork within the brigade must be taken as the yardstick of battle teamwork. There is teamwork in a section and teamwork in a division, but below the brigade it is only technical method according to the arm, while above the brigade the term "co-ordination" would be more appropriate. A smaller team than the brigade will be found in the guerrilla column, but this is for a special type of warfare, or in the commando, which is for a special type of task. The same teamwork is required in the brigade as in a special task team, but it is required over a more protracted period and it must be capable of meeting all forms of warfare.

### Arms and Services

The unit capable of protracted operations is made up of a main arm, supporting arm, and services. The main arm is the arm that is best suited to carry out the mission in hand, and while some or others of the supporting arms may hold the stage for a while it is always the infantryman who clinches the issue. The services are the necessary medium between the combat arms and outside units to ensure the functioning of the team.

A unit which by nature is a supporting unit can be withdrawn by a higher command without upsetting the functioning of the team, but a service cannot be withdrawn. This is the essential difference between a combat arm and a service. A battalion commander should be more worried if one of the brigade's essential services is inefficient than if one of his own companies is weak. There is a reserve to close the gap formed by the weak company, but there is no reserve for the inefficient service, and the whole team suffers.

### Protracted Exercises Necessary

The change from peace to war is not an equal change for all units. The infantryman gets as good practice firing at a silhouette target as he will at the enemy, but the medical man has little comparison between a "casualty" and a casualty. The artilleryman finds less change at his observation post than does the supply man who is faced with full-scale supply for the first time.

Only in a protracted operation are all the arms and services tested. The field ambulance

will not be tested until full-scale evacuation of casualties is reached and is properly oriented with rear collecting agencies. This does not happen at the opening of hostilities, and here we see a fault with the maneuvers or exercises of short duration. The same applies to a supply service. As a rule, the supply and evacuation services do not get proper exercise if the action is short, and their part is more difficult to simulate. To make things more difficult, they cannot rehearse for war on their own account, but require the presence of the arms they serve and the bases with which they work, in order to get reality into their work.

When, therefore, the team is brought together for a combined exercise, it must be remembered that it is really an initial exercise for the units which are functioning agencies of the team as a whole, like communications, supply, and evacuation units.

As time in making contact with an "enemy" does not test supply and evacuation, it is necessary to protract the exercise, or conversely continue it from a previous one. In short exercises the cavalry get more than their quota of the value of the exercise than does the team as a whole.

### Peace-time Influences

In peace-time there is a danger of overlooking the importance of the battle team. Each arm and service within the team has its own commanding officer, its own ledger, and its own separate accountancy, which tends to put it in a watertight compartment. It is inspected by technical officers of its own branch who rate its efficiency. But as each separate arm is ineffective on its own, the only rating that is of any value is its efficiency as a member of the team. Unless a unit knows the capabilities and limitations of the other members of the team its training is not complete, and it will clog the action of any unit it contacts. A further adverse effect of peace-time usage is that we sometimes fail to see the value in the other man's equipment. A stretcher, for instance, is just an item on the ledger of some field ambulance company, while in war it is a convenient method of carrying a wounded man, and its value then appears in a new light. The same comparison could be made for any unit or equipment, and we begin to see that peace-time accountancy is really there to ensure that all members of the team turn out in war with the best possible equipment. It is difficult to see the value of a thing until you require it. The infantryman will see the value of artillery for destroying something on which his rifle has no effect. The artilleryman will appreciate the value of the engineer when he comes to an unfordable river. When ammunition runs low the supply officer is the man of the moment, and when casualties run high an efficient medical service will sustain the morale, and so on until all the members of the team are examined and their important roles in battle made clear.

### War Influences

In battle the several arms of a formation knit closer together. What is one unit's strength is the other unit's weakness. They can fight as a team but not as individuals, and even with no higher aim than that of self-preservation, that instinct in itself will herd them closer together. Historically, the arms are coming closer together, and it is becoming more difficult to identify the individual members of the team. The infantry-artillery team is now far removed from the time when, in the time of Gustavus Adolphus, the Guild of Cannoneers gave their services to the infantry on requisition. Up to the first Great War the liaison between them increased. Now the two arms are so closely knit together that the term "liaison" is obsolete as far as the field gun and the small arm is concerned. For where you have the one you require the other, and teamwork must be so high that liaison is superfluous. The engineer has now come into the combat units to fight. No amount of peace-time exercise can teach a lesson like war, but good imagination of war conditions will help to prepare the mind and cut out psychological surprise.

### Make the Arm Suit the Man

There should be a free exchange of men

within the team. Recruit depots cannot say for certain what arm or service a man is best suited for. But if he is not suitable in one place in the team it should be possible to change him after a trial without much trouble. If he is not replaced you will get the next recruit. Here the selfish unit will cause damage by keeping a man who is more suited for another arm because he is a good footballer or good at some other game. Send him to the unit he is most suited for, because the battle team is more important than the football team. The Germans pay a lot of attention to this selection work, and the men are under constant observation to see that they are in the unit for which they are most suitable.

### Exchange of Knowledge

There should be a constant exchange of knowledge within the team. The artilleryman should tell the cavalryman how to destroy a field gun—he is more likely to have to do the job. The cavalryman can, in turn, say where the weak points of his tanks are, so that the artilleryman can know where to hit them. As a rule, it is the weak points of a weapon, or its limitations, that the other members of a team want to know. The enemy with a similar weapon will show its capabilities, making sure at the same time to conceal its limitations, and if you don't know these beforehand he won't teach you them. It is only human to have pride in and boast about your own unit, but when talking to the other arms of the team drown your pride and show where the weak points are. A cavalryman lecturing on his tank is prone to emphasize what it can do in order to awe his listeners; if, on the other hand, he started by saying that his weapon was of limited value at night and that an infantryman in a slit trench with a bomb was its master he would be leading the infantryman somewhere. Again, an artilleryman might admit, after some pressure, that it is waste of ammunition firing at an infantryman in a slit trench, and that if he hasn't a slit trench a shell-hole is nearly as good.

### Esprit de Corps

There should be a high degree of comradeship between the units of a battle team. They have to fight together, and each depends upon the other in battle. An infantryman, however good, can be stranded at the critical time by faulty supply. A forward in a football team trusts to the back to supply him with the ball and he has many talks with him as to how to do it and as to where he will be found. The combat man and the supply man should have a far more serious talk about how that ammunition will be sent forward—and, unlike the footballers, they cannot have practice with the genuine article—in their case live ammunition. At least, however, they can both be present and use a dummy, but if the other arms are not there with their different "equipment" the game cannot be played on the best lines.

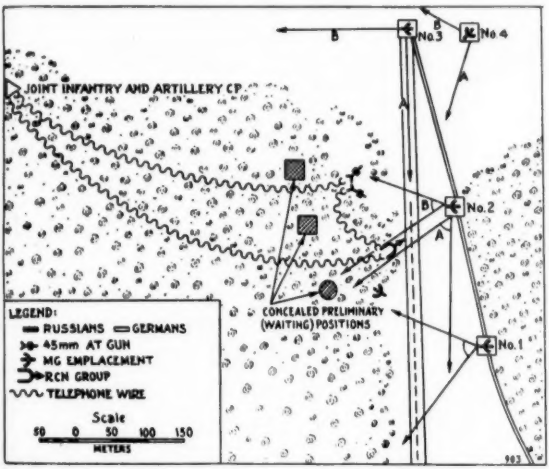
### A Versatile Unit

Teamwork and exchange of knowledge within a unit will go far to making a unit versatile. This is now a very important aspect of training. With the present speed of war and with the continual addition of new weapons, if a unit is not quickly able to adapt itself to new forms of attack it will be destroyed. Some member of the team has the antidote, and you should know who he is, where to find him, and what assistance you can give him. A man should know a lot about his own arm and something about every other one. An arm in support of a unit should not be considered as fighting beside that unit but in it, and forming a larger team of greater potential. The influence and effect of an additional arm to a team will affect all the other arms of that team, and they should be quick to establish proper contact and adapt themselves to the altered roles they may have to play. It is like adding a new suit to a pack of cards until it merges with the other suits and new hands are dealt; if the value of the added suit is not known a player will not know the new value of his hand.

# Cooperation of Infantry with Artillery in Reconnaissance

Translated and digested at the Command and General Staff School from a Russian article by Colonel A. A. Labazov in *Artilleriiskii Zhurnal* (Artillery Journal) July 1943.

A PLATOON of antitank artillery (there are two guns in a platoon) was ordered to support an infantry reconnaissance group, the mission of which was to capture prisoners and documents if possible. The area where the action was to take place had been previously studied by the artillery and infantry observers. The following information had been obtained (see sketch):




1. The forward edge of the reinforced combat outpost of the enemy passed through three machine-gun emplacements, Nos. 1, 2, and 3.

2. Another emplacement (No. 4) was located to the rear of No. 3.

3. Most active were the emplacements 2 and 3.

4. Emplacement No. 1 had one embrasure. No. 2 had two embrasures with fields of fire "A" and "B." Emplacements 3 and 4 also had two embrasures each; the directions of fire are indicated by "A" and "B" on the sketch.

5. An antitank ditch one meter deep protected the forward edge. It was covered by the fire from emplacement No. 3.

On the basis of this information, the following decision was made:

1. The reconnaissance group is to attack emplacement No. 2; the fire of machine-gun emplacement No. 1 and possible fire delivered by enemy submachine gunners from the woods between No. 1 and No. 2 are to be taken care of by the group itself.

2. The platoon of 45-mm antitank guns, using direct fire, is to secure the action of the reconnaissance group by firing at emplacements 2, 3, and 4.

3. The withdrawal of the group and of the antitank platoon is to be secured by the action of two concealed artillery batteries.

4. A joint operational command and observation post (infantry and artillery) is to be established to direct the operation.

The plan of action was as follows:

1. To carry out the operation at dawn, upon command transmitted by telephone from the command post (prearranged telephone signal). Duration of reconnaissance raid—fifteen minutes.

2. Action of the antitank platoon: number one piece, to suppress, first, emplacement No. 2, then No. 4, using rapid fire and from four to six rounds per emplacement. Piece number two opens fire at the same time and suppresses emplacement No. 3.

3. The machine gun assigned to support the action opens fire on emplacement No. 1 and on the edge of the woods to the left.

4. The reconnaissance group raids emplacement No. 2 as soon as the fire of piece number one is transferred to emplacement

No. 4, and withdraws immediately after accomplishing the mission.

*5.* The command post observes the area of the action and maintains communication with the group.

*6.* The two artillery batteries stand ready to cover the withdrawal.

The line of departure was located in the shrubs, 100 meters from emplacement No. 2. This area was within the dead space of emplacement No. 2 (it was located directly opposite the corner of the emplacement). The position for the machine gun was selected a little to the right and to the rear of the line of departure. Firing positions of the antitank guns were at the edge of the woods, 150 meters from emplacement No. 2 and 200 meters from No. 3. Besides, concealed positions (waiting positions) were also selected in the woods. The joint command post occupied one of the artillery observation posts.

The removing of mines, fixing firing positions, stringing wire, moving the antitank guns into concealed (waiting) positions, and getting ammunition were all done at night. Telephone wire was laid as far as the preliminary position also at night. About ten coded phrases were decided upon for telephone conversations and memorized by all the participants. Shortly before dawn, the antitank guns and the reconnaissance group occupied their respective positions. Telephone communication was established between the group and the antitank guns. Everything was in readiness. The infantry and the artillery commanders were at the command post. After a final check and the report of readiness, the command post telephoned: "Go to work." After a brief artillery raid on emplacement No. 2, the scouts rushed forward, reached the emplacement, and accomplished the mission. Everything went according to plan.

All the emplacements were either suppressed or blinded; the machine gun at No. 3 was destroyed. As a result, the scouts not only accomplished their mission (taking prisoners) but brought back the enemy machine gun from emplacement No. 2. The group did not suffer any casualties. The entire operation was completed in ten minutes. The withdrawal of the group was carried out swiftly and without losses. The enemy opened mortar fire in about twelve minutes after the scouts had assaulted the emplacement, but it was too late.

### Conclusions

The success of the action was due to the following: (1) correct organization of cooperation between the infantry reconnaissance elements and the artillery, (2) accurate and well worked out planning of the infantry action, (3) thorough training and preparation of the participants, and (4) suddenness and swiftness of action.

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## Holland: Liquid Fortress

Translated at the Command and General Staff School from a French article by Gerhard Krause, War Correspondent, in *Pariser Zeitung*, Paris, France, 5 April 1944.

THE numerous water courses of Holland, besides the Escaut, the Meuse, and the Rhine, already constitute, on account of their depth, important obstacles to invading troops. But since the level of these numerous streams is higher than the average altitude of the lower areas, there exists in time of war the possibility of effecting artificial inundations which will contribute still more to the power of resistance of the country. More than a fourth of the whole area of the country is made up of polders.

Polders are areas which have been won from the sea by building dikes and drying the land, and which have been placed under cultivation. These polders are, to a large extent, but very little above the level of the sea and the streams. They are traversed by

numerous canals where the excess water collects. This water drains from them into basins or canals called *Busen* which empty into the ocean at low tide. These *Busen*, which average several kilometers in length, serve at the same time as navigation canals. The natural water courses, canals, small *Busen*, reservoirs, ditches, etc., form an incredibly continuous network covering the whole country. Out of a hundred square kilometers of surface, about twenty square kilometers is occupied by water courses. This intercommunicating system extends over so great a surface that if, for example, at the northern point of Holland near Den Helder (opposite Texel Island) one lets the water in, one hundred and twenty kilometers farther to the south, somewhere between Rotterdam and Utrecht, the water will rise high enough in one of the *Busen* to inundate part of the country.

It is therefore not surprising that Holland has served as a theater of operations in no war without inundations having been used as a weapon of defense. After 1814, the Dutch went for one hundred years without having to have recourse to this method. In 1939, after the conclusion of the Polish campaign, inundations were effected and maintained until the spring of 1940.

When Holland was included in the continental defense front against England, there were a great many things to be done. The coast of Holland is, generally speaking, flat, but a chain of dunes, which sometimes attain a height of sixty meters, provides the defenders with good vision, aids in defense against landings, and, due to its sand, attenuates the effects of hostile weapons. Along the shore of the sea, the system of coastal defense is completed by antitank obstacles. A line of resistance with depth is constructed back of the coast. Concrete walls several meters in thickness protect the garrisons from bombing and artillery fire. In addition, well fortified field positions have been provided for quick reaction in case of any attempted invasion. There is not, as Field Marshal von Rundstedt has said, any "Maginot spirit" among the troops occupying them.

Provision had been made at the very outset for reinforcing the defensive capacity of this system by inundation. In those places where water courses lead into the interior of the country from the sea, it is possible, by causing them to overflow, to paralyze the landing attempts of the enemy. In the interior of the country, the artificial waterways would limit the landing possibilities of paratroops.

The Dutch inundated the country in 1939-1940. In February they began to evacuate the areas that were to be inundated, and soon the water covered the first of the polders. The operation continued by zones at a predetermined rate. Scarcely had the last vehicle left a village than one saw the water gush forth from the ground as if impelled by a distant force, and patches of water began to form. These inundated areas no longer form a part of the sea, and though the "amphibian operations" of the English and Americans may function equally well on sea or on land, they certainly cannot do so in this intermediate element which is neither solid nor liquid. Both tanks and light vehicles would be bogged down without fail and if enemy infantry attempted to advance across this muddy expanse they could find no cover against our fire, and very soon the ground itself would disappear beneath their feet—they would fall into the ditches of the polders which are invisible under the water. The water is too shallow for vessels, and in addition, in those places where the need for it has been recognized, obstacles have been set up. For those portions of the country which remain in their normal condition, such as the dikes and railway and highway embankments, a special system of defense has been provided. It is obvious that they present but very limited possibilities of movement for an invasion army. We may rest assured that the German troops with their war experience will be able to assure the barricading of these passages in a more efficient manner than the Dutch troops did in 1940.

# Fighting Enemy Mortars

Translated at the Command and General Staff School from a Russian article by Colonel I. Khrutzky, Soviet Army, in *Krasnaya Zvezda* 20 November 1943.

MORTARS are widely used by the German Army. They often supplement and at times substitute for the artillery. Massed mortar fires are used in an attempt to stop our advancing infantrymen, to hold them to the ground, and to cut them off from the tanks. Therefore, the destruction of German mortars is one of the most important missions of our troops. Skilful accomplishment of this mission accelerates the advance of our infantry units and decreases their losses.

Successful destruction of enemy mortars depends, in the first place, upon a well organized reconnaissance and upon the ability of the staff to analyze correctly and thoroughly the available information. The reconnaissance is complicated by the fact that the Germans place their mortars in woods, gulleys, valleys, shrubs, i.e., in places where neutral camouflage makes the use of either sound or flash methods difficult. The report of a mortar fired from such places is dull and the weapon seems to be far away. It has been determined that the report of a mortar firing in a wooded and marshy area is aways dull, and is heard up to a distance of three kilometers. In areas with dry and sandy ground the sound of firing is sharp and short, and is heard at a distance of up to four kilometers. A firing mortar is most successfully detected at night by sound and flash observation posts. The location of a mortar by intersection is accomplished during a short flash which is accompanied by a characteristic sparkling.

The German Army possesses various types of light and heavy mortars. The light 50-mm and 81.4-mm mortars are included in the general fire system of centers of resistance. The firing, for the most part, is conducted by separate mortars, and seldom by batteries which displace gradually.

Our infantry units can take care of German light mortars with their means. Often our 82-mm mortars suppress them quite effectively. To do this, enemy mortars are carefully watched and fired upon as soon as detected. Direct fire of 45-mm guns (time fuze) has also been found to be effective.

To suppress heavy mortars, special anti-mortar groups are formed. Basically, they operate according to the principles of counter-battery groups. Great flexibility in the transfer of fire and the hourly analysis of reconnaissance data are necessary. The point is that the enemy regroups his mortars often and it is quite important to prevent this by opening a sudden and strong fire.

The detection of such a regrouping calls for a well developed system of observation and sound ranging. During quiet periods, it is better to rely mainly on the sound method; but during intensive firing, on visual observation with the use of bases long enough for accurate location of targets. In marshy and wooded areas, it is useful to establish observation posts over the tree tops in order that not a single flash will escape notice. It is to the advantage of the battery commander to be at one of the posts, where he will receive the coordinates of enemy mortars much more quickly.

As a rule, German six-barreled mortars do not use permanent positions. This complicates their detection because the sound platoon does not always have enough time to locate the target. Let us analyze an operation against six-barreled mortars in one of the offensive battles.

A few days before the battle, fourteen firing positions of six-barreled mortars had been located in an enemy center of resistance. They comprised three clearly defined groups. Before the battle, the commanders of nine specially designated guns had received definite targets and carefully prepared fire data.

Shortly before the attack, the mortar positions were subjected to shelling. These positions were carefully watched, and this enabled the commander to determine in time the location of the mortars which had fired

Almost immediately their positions were subjected to intensive shelling, which was alternated with the methodical firing by the guns. Thus the enemy mortars were under an uninterrupted fire of our artillery during the entire battle, and were definitely suppressed. This helped the operations of the attacking infantry.

In another battle an interesting and effective method was used by a battery commander. When at the observation post from which a part of the road leading from the enemy rear to the battlefield was observed, the battery commander noticed a movement characteristic of mortar batteries. He ordered his battery to have the guns ready and sent in initial data for opening fire at his command. In giving this order, the commander supposed that the six-barreled mortars would appear on this road, as it was well adapted for their use. The commander was right. On a turn of the road there appeared shortly a column of smoke—"fire arrows": a six-barreled mortar had fired. The battery commander rapidly corrected the initial data and ordered the opening of fire. Later on, on the spot fired upon by the guns, was found a wrecked six-barreled mortar.

**General Conclusions**

*1.* 122-mm howitzers and 120-mm mortars—effective weapons for suppressing enemy mortars—should be included in the antimortar and artillery groups.

*2.* The antimortar group should have a well developed network of observation posts. It should maintain close liaison with the sound units and quickly utilize their reports.

*3.* The entire personnel of the antimortar group should be familiar with the tactical and technical characteristics of enemy mortars and the methods of their detection.

*4.* If the enemy defense includes many mortars, it will be necessary, in addition to the antimortar group, to employ the division and regimental artillery. Their missions should be assigned beforehand. The divisional and regimental guns will suppress and destroy enemy mortars situated in the trenches and on the forward edge of the defense.

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# Employment of German Night Pursuit Planes

Translated at the Command and General Staff School from a German article by War Reporter Hans Theodor Wagner in *Kölnische Zeitung* 3 April 1944.

WHEN the command of the British bomber formations intensified their terror attacks on the German Reich and the attacks themselves were directed no longer, as at first, in several waves, but in massed formation and all at the same time at the same target, the emphasis in the German defense shifted to the night pursuit plane. The idea was to reduce the force of the night bomber attacks before the target was reached. It was imperative that night pursuit activities be intensified and their effectiveness increased. Various types of German pursuit planes were flown, all of them two-motored and heavily armed. Total results were great, but still were insufficient for dealing a blow at the enemy's formations effective enough to make the resultant losses unendurable.

In this situation an experienced combat flier, who had already flown on several hundred missions over English territory and who was particularly acquainted with the requirements of night operation, developed a plan, the application of which meant the revolutionizing of night pursuit methods. Colonel Hajo Herrmann, the present Night Pursuit Inspector, carried his plan into effect, and within a few weeks after the establishment of the first small night pursuit formation he was already able to report brilliant results. His new night pursuit method, employing small, single-motored pursuit planes above the target which was being attacked, without regard for antiaircraft fire, was so fantastic and unheard-of that many a clever and experienced flier shook his head in doubt

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with regard to it. This night pursuit with single-motored planes, called "wild hog" (*Wilde Sau*) because single-motored planes circle about and pursue their prey like wild hogs, is the secret of the latest outstanding victories over the British terror-bombing formations.

Colonel Herrmann reports: "The former system of night pursuit had to be expanded to include pursuit with single-motored planes which, as is well known, are very fast and highly maneuverable and whose armament is at least as powerful as that of the heavy, two-motored planes. In addition to this, the single-motored pursuit plane offers but a relatively small target to the enemy and the pilot is safe and protected behind an armored motor. But the 'wild hog' is employed, in contradistinction to the method followed with the heavy pursuit planes, over the area of the target itself. The massed employment of several hundred single-motored pursuit planes above a city that is being attacked can not fail to cause heavy losses to the enemy.

"The 'wild hog' method has been very effective. At the present time, not only single-motored pursuit planes but also heavy pursuit formations with two-motored planes have begun to operate over the target. Each night, pursuit formations are assigned definite areas over which to operate. The various night pursuit areas are so divided that enemy formations flying into German territory are always in an area belonging to some pursuit formation and in this way are continually attacked by new formations.

"The results will be apparent only with the passing of time. The first result of the method was that the British immediately made their night attacks only during periods of dark nights and bad weather. But dark nights and solid cloud coverings are no longer any problem for the 'wild hog' pilot unless low clouds and ground fog make safe landings impossible. And if it is at all possible to start, the 'wild hog' starts.

"In the meantime, our auxiliary equipment and instruments have been so perfected that the combat of the British terror formations has become more and more effective. It goes without saying, also, that our formations are constantly being perfected and reinforced."

Very special flying ability is required for night pursuit with the "wild hog," for one is not able to fly about the whole night long in a single-motored pursuit plane. The shortness of the fuel supply forces the flier to land after a few hours time, before the dreaded red light shows up which indicates that he has gas left for only fifteen minutes of flying.

The night pursuit pilots seek their prey at the greatest altitudes. In the glare of the enemy's target-marking flares, in the glistening light of our own flare bombs, and above clouds which are illuminated by powerful antiaircraft searchlights, the night pursuit flier sees the enemy bombers looking like wasps moving over a bedsheet. Often the enemy crews are so blinded by the glare of the fires they have set that it is only at the last moment that they recognize the little dark dots of the attacking night pursuit planes which plunge down like swarms of hornets onto the big bodies of the four-motored bombers.

The successes of the German night pursuit formations are not the result of individual feats of especially outstanding night pursuit fliers, but of many excellently trained crews. We may look ahead with confidence to the further development of aerial night combat which one day, we may be sure, will turn in our favor.

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**The reality of the field of battle consists in the fact that there is no studying done there; one simply does what he can to put into practice what he knows.**

—Marshal Foch

# German Field Fortifications

Translated and digested at the Command and General Staff School from a Russian article by Colonel A. Molchanov and Engineer-Major Y. Galkin, Soviet Army, in *Voyennaya Mysl* (Military Thought) July 1943.

IN ORDER to direct the activities of reconnaissance elements properly and to be able to generalize upon the information collected by them, it is extremely important to know the basic principles of German defensive fortifications. Some of these principles can be ascertained from the study of the organization of German fortifications in the regions which have already been liberated by our troops.

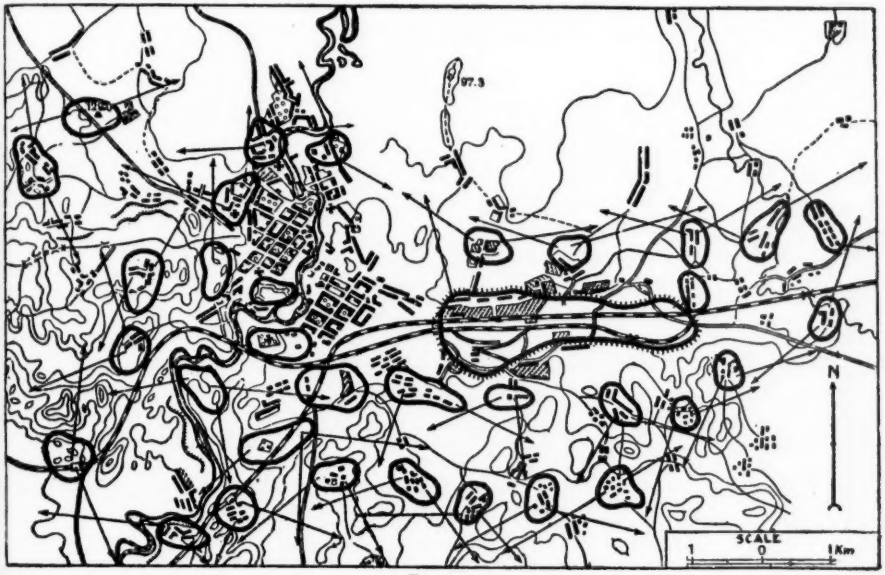


FIGURE 1.
DEFENSES OF A LARGE POPULATED PLACE.

*1. Field fortifications in the northwestern sector of the front, built on the approaches to a large populated place and characterized by broken terrain* (Figure 1).

There are many hills in this region, and a few small rivers which form, on the northern approaches to the populated place, a swampy and hardly passable area.

The defense of the area was based on separate strongpoints and centers of resistance, which were built to take full advantage of the terrain features and to provide mutual fire support. The extent of fire support, however, was not uniform throughout the zone, and not all the gaps between the strongpoints were prepared for occupation by troops. This shows that the German army regulations pertaining to fortifications are not always followed in practice and demonstrates the vulnerability of separate, most important links of their defense. It should be admitted, however, that from the tactical point of view, most of the strongpoints were distributed correctly. They were located on commanding heights and in villages situated in the most important areas and on the most important roads leading to the town.

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Each strongpoint had its own individual character and was constructed to conform to the peculiarities of the terrain and to the importance of the sector it covered.

Though most of the strongpoints were adapted for all-around defense, the main mass of fortifications and of fire means was concentrated along the front and on the flanks, while the fortifications in the rear were developed to a much lesser extent.

The basic element of the fortifications of almost all the strongpoints, including those in the populated place, was the extensive system of trenches with open emplacements for machine gunners, riflemen, etc. Shelters and dugouts were located in the immediate vicinity of firing positions. In many strongpoints, in addition to trenches, there was a number of emplacements built of earth and timber with light, reinforced overhead cover. In a number of cases, houses and other buildings were also adapted for defense. The main firing positions, however, were outside the buildings, in the streets and even in the outskirts of the populated place.

The strongpoints were surrounded by one, two, or three rows of wire entanglements. The entanglements were reinforced fences on tripod trestles made of stakes in winter, or on stakes driven into the ground in summer. More heavily protected by various antipersonnel obstacles were the strongpoints on the eastern and southern approaches to the town. Here wire obstacles were reinforced by mines with pull-type detonators and various booby traps. The intervals between the strongpoints along the more probable routes of tanks and infantry were protected by minefields.

The strongpoint in the village of Dyakovo was a system of fortified firing positions and fortifications in the first zone of defense. Taking full advantage of the terrain, the strongpoint strengthened a natural obstacle—a river with steep banks. On the enemy side of the river there was a series of timber and earth emplacements which flanked the banks and covered the approaches to the river. These emplacements were connected by a continuous trench, which stretched along the bank and merged with a network of trenches in the depth of the strongpoint. It should be noted that fire and communication trenches were developed mainly along the front and on the flanks. In the rear, the trenches and firing positions did not represent a continuous line.

The trenches were equipped with rifle pits and platforms for machine guns. All firing platforms had overhead covers and were built for firing in three directions. The firing ports of the timber-and-earth emplacements were covered with wire screen on the outside for protection from grenades and for camouflage purposes. In spite of the fact that there were

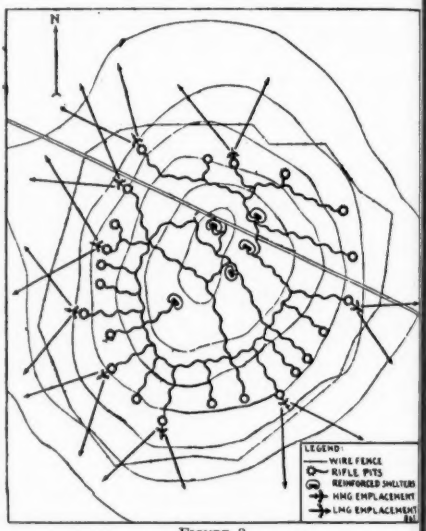


FIGURE 2.
STRONGPOINT ON HILL 129.

quite a few buildings in Dyakovo, many firing positions, shelters, and dugouts were built outside of the buildings. Its defense was based, not on the use of the existing wooden buildings, but on the extensively developed and especially constructed system of fortifications outside the buildings. Mortar positions were located in the depth of the strongpoint and were connected with the fire and communication trenches. There was a one-row wire fence along the front on our side of the river. In the rear, on the right flank, there were two rows of wire entanglements.

The strongpoint on Hill 129 (Figure 2) is characteristic of the German system of defense. The hill commands the surrounding area and has good observation and field of fire over a distance of up to three kilometers. From here the enemy supported by fire the nearest strongpoints. The sketch shows that this is a case of a well developed circular system of defense with an extensive network of fire and communication trenches. The hill is girdled on one side by a trench with a large number of spider-like extensions leading into eighteen rifle pits and seven heavy machine-gun emplacements. In addition to this, the hill was broken by a series of trenches and communication passages connecting the main trench with dugouts and reinforced shelters.

The fire and communication trenches were open and of varying depth (0.5-1.1 meters) and width (0.8 to 1.1 meters at the top). The height of the parapet was 0.3 meter. For ammunition, recesses were cut in the ground (0.5 x 0.5 meter). The strongpoint was occupied by one platoon. The shelters had overhead covers made of four layers of logs under a layer of earth. Each shelter was intended for a squad. Along a contour line of the hill, and a little above its base, a double-row wire fence was erected. All approaches to the strongpoint from the roads were mined.

*2. Field fortifications in areas characterized by wooded and swampy terrain.*—The so-called "Demyanskii Fortified Area" is a good example of such fortifications. This area was nearly fifty kilometers wide and about 200 kilometers long, not including its western extension. The enemy held it for a year and a half and constantly developed and perfected its defenses. It should be noted that the terrain was favorable for defense. It had a limited number of areas through which tanks could pass, and it was fairly inaccessible to infantry in a number of sectors. These sectors were swampy, had many water obstacles and wooded areas, and were characterized by broken terrain. All this enabled the enemy to hold the area with comparatively small forces —six to seven divisions. Each division, therefore, had a frontage of about thirty kilometers, and the defense of the area was accomplished mainly by mobile reserves.

The defensive zone consisted of separate platoon, company, and sometimes battalion strongpoints with mutual fire support. All spaces between the strongpoints were under observation and could be taken under machine-gun and artillery fire. As a rule, unoccupied spaces were equipped with trenches protected by obstacles. Depending on the terrain, some of these areas were covered by strongpoints located in the depth of the defensive zone.

A peculiar feature of the area was a line of trenches going around and covering the area from the south. In front of these trenches there were several strongpoints for the protection of the most important roads. Besides, there were a few separate strongpoints in some sectors in the depth of the fortified area.

The area had an extensively developed network of roads which secured the maneuvering of the reserves. The roads extended to company defensive areas and, in places, up to the forward edge. Roads in the rear of the south line of trenches were constructed parallel to the front in most sectors. These positional roads enabled the Germans to maneuver their forces along the front. The use of these roads was facilitated by the extensive employment of vertical vegetation masks. There was also an extensive network of telephone wire between the forward edge and the rear. In the depth of the fortified area, there were artillery positions, command posts, positions for reserves, landing fields, supply stores, ammunition dumps, and garages.

The main element of fortifications of the forward edge was trenches along its entire length. The trenches averaged up to 1.5 meters in depth. They contained firing positions which were, in most cases, open emplacements for heavy machine guns, submachine guns, and riflemen. The emplacements were built from six to fifteen meters apart. Their walls were made either of single log frames, pickets, or brushwood hurdles. Emplacements with overhead splinterproof cover for riflemen and machine guns were found in the same trenches but were encountered less frequently. The trenches were

also equipped with open platforms for 37-mm and 75-mm guns.

Minefields were laid, almost without exceptions, on roads and in areas accessible to tanks, from 100 to 150 meters from the forward edge. In the vicinity of roads they were extended up to the forward edge. The predominant type of mine was "T-35."

The barbed wire was usually strung in one or two rows. In a few cases, the first row was erected at a distance of five to fifteen meters from the trenches, which can be explained by the difficulty of setting it up under fire. Antipersonnel mines were thirty to fifty meters from the wire fences. In certain sectors and in the intervals between the strongpoints, the wire obstacles were always built in two lines. At times, they were protected by minefields. In places, the mines were controlled from the forward edge. Many types of wire obstacles were used—cheval-de-frise, concertina, spiral, etc.

In the immediate proximity to the forward edge (from fifteen to thirty meters) were located shelters of various construction. They were built chiefly on the back slopes. With the firing positions they were connected by covered communication trenches and a well-developed system of signal communication. Firing positions for mortars (mainly, 81.4-mm), which were open platforms, were also located on back slopes.

Long-range fires were delivered by heavy weapons from open emplacements. Similar emplacements were used for close-range submachine-gun and rifle fires. Heavy machine guns near the forward edge delivered flanking and oblique fires.

The trace of the forward edge permitted flanking, oblique, and cross fires, as well as extensive maneuver by fire along the front. For this purpose, the enemy attempted to create wide fields of fire for both the platforms and the individual fire trenches. The firing positions were built in such a manner as to allow the use of various types of fire means. The well developed system of trenches facilitated the organization of fire and the maneuvering of the manpower.

The strongpoints were located mostly on commanding heights, and the utilization of terrain features permitted the coverage of main roads and areas.

Two types of strongpoints can be distinguished: those without sharply expressed circular defense and those with circular defense.

The first group of strongpoints was part of the ring of fortifications encircling the fortified area. The strongpoints of this type were characterized by echeloned construction of trenches (two or three lines). Their fire means and obstacles were on the flanks, and their shelters were disposed in groups. These strongpoints were not defended from the rear.

The second type was used wherever strongpoints were located separately or moved far out. Such "isolated" strongpoints had a well-defined circular defense which was secured by proper location of firing positions and obstacles, as well as by a developed ring-like system of communication trenches and vertical masks. The basic feature of such strongpoints was the ring-like trench.

The defense of the intervals was secured by flanking artillery and machine-gun fire. The intervals had one line of trenches of zigzag trace.

Immediately behind the trenches there was located a line of shelters and, at a distance of from 300 to 500 meters, a group of shelters for reserves and mobile groups which defended the intervals.

Command posts were usually located within a group of shelters and trenches adapted for defense. The battalion command posts were from 1.0 to 1.5 kilometers and company command posts from 300 to 400 meters from the forward edge. Observation posts were either separate towers, trees, or wrecked buildings.

*3. Battle position of the German Infantry Division.*—Depending on the terrain, the German infantry division, defending an important sector, occupies a zone from five to twelve kilometers along the front and from three to five kilometers in depth; the regiment, from three to five kilometers along the front (Figure 3). In hardly accessible and broken, or wooded and swampy terrain, the defense is

organized on a wide front, and the division may have a frontage of up to thirty kilometers. The defensive position of the division consists of battalion centers of resistance and company (platoon) strongpoints, situated in tactically important sectors of the position (populated places, commanding heights, isolated groves, etc.). Such terrain features serve as the framework of the defense.

The intervals between strongpoints and centers of resistance are provided with fortifications for occupation by troops and are well covered by machine-gun fire. In the majority of cases, the strongpoints, as well as the battalion centers of resistance, are connected by a continuous trench or by concealed communication trenches. The strongpoints are provided with two and sometimes three

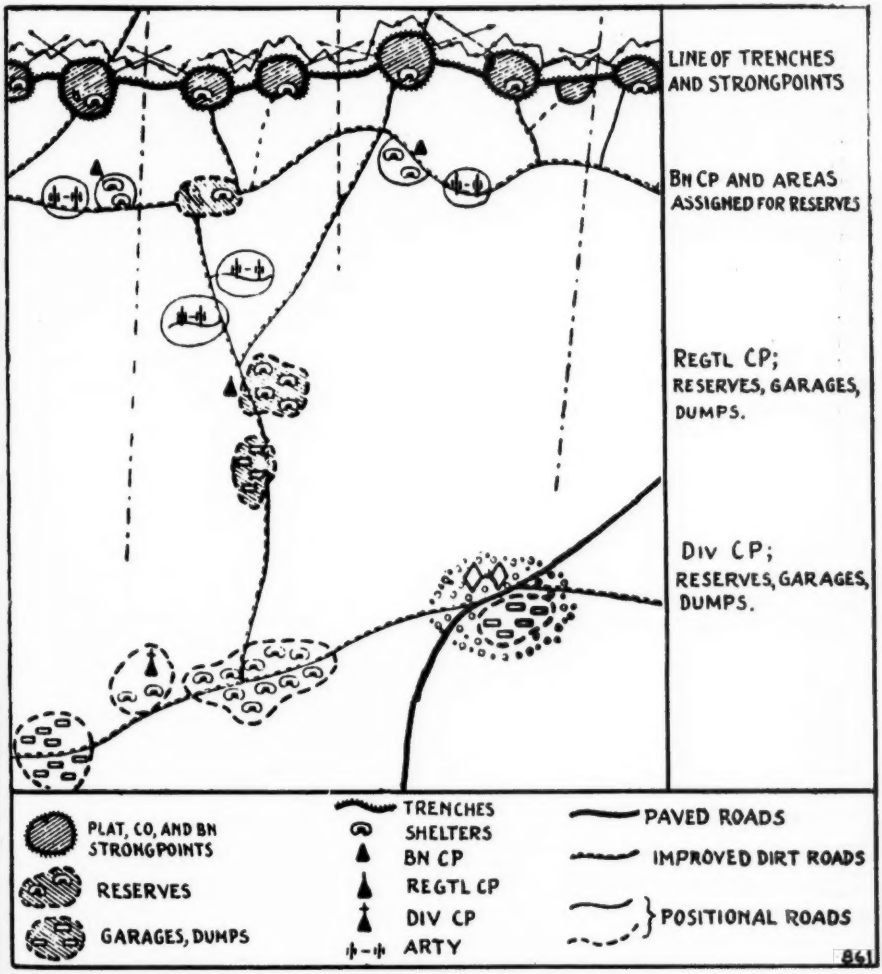


FIGURE 3.
DEFENSE ZONE OF A GERMAN REGIMENT.

lines of trenches. As a rule, centers of resistance and strongpoints are tactically independent elements of defense. A center of resistance consists of three or four company strongpoints, which in turn are made up of two or three platoon defensive areas, each with a number of fire nests. The battalion center of resistance is two kilometers along the front and from one and a half to two kilometers in depth; company strongpoints are 800 to 1,000 meters along the front. The average density of fire weapons (without rifles) is from six to eight guns, five or six heavy machine guns, seven or eight mortars, and from twenty to twenty-five light machine guns per kilometer of front.

Depending on the terrain and the location of strongpoints, they have either circular, semi-circular, or linear defense.

Trenches are the basis of the fortifications of German strongpoints. Trenches are usually equipped with "universal," open, rifle, and machine-gun emplacements. All earth-and-timber and reinforced concrete structures are connected with the trenches by communication passages.

German trenches are either circular (in circular defense), semi-circular, or linear. The last type is found chiefly in swampy and forested areas of poor accessibility.

Fences made of poles, boughs, brushwood, and similar materials are used as concealed communication passages.

Fortification structures are simple in construction and intended mainly for protection from splinters and mortar fire. Reinforced and heavily fortified structures are used only in tactically important areas, when proper local materials are available.

Most defense structures are of the light type and can be easily destroyed by accurate artillery fire with 105-mm shells or larger.

Open emplacements for firing rifles, submachine guns, and machine guns are very widely employed by the Germans. Such "universal" platforms, representing the basic element of the equipment of trenches, are much more numerous than covered emplacements. Such firing positions are easily built without a great expenditure of materials, which permits a rapid preparation of a series of alternate positions and facilitates a wide maneuver by fire means.

As already mentioned above, populated places are the basis of defense. The forward edge is usually beyond the limits of the populated place, at a distance of from 100 to 300 meters, and in some cases even farther. Everything that can reinforce the defense is utilized. More durable structures are connected with each other and with those beyond the edge of the populated place by communication trenches and telephone. The streets are often dug up and blocked with wire, and the buildings interfering with fires are torn down. On the approaches to and within the populated place, wire entanglements and sometimes antitank ditches are built between buildings. Antitank and antipersonnel obstacles are very widely used. In one large populated place, for instance, more than 2,000 mines of various types were removed, and in another, over 4,000.

The Germans pay a great deal of attention to the organization of fire in populated places. It is based on machine guns and mortars which cover by flanking and, if possible, by cross fire all approaches, obstacles, streets, and passages within the village, and secure mutual fire support between the strongpoints. When it is impossible to secure fire coverage for a street or a passage by firing from houses, special firing positions are constructed outside. Antitank guns and antitank-rifle units are used in areas accessible to tanks and at the entrances to the populated place. Mortars are often placed in cellars and attics, while mortar batteries are located in the rear outskirts of the village. Sometimes, the upper stories of buildings used for firing positions are destroyed for the purpose of camouflage. Tanks are often used as stationary firing positions for night battles.

Forest tracts within defense zones are also adapted for defense. Firing positions are usually located in the depth and distributed so as to secure considerable concentration of fire along the roads. Fields of fire are cleared. Pillboxes with circular defense are built at intersections of roads and lanes. For flanking machine-gun fire, lanes are cut through the

forest. Wire entanglements are set up, and separate sectors are mined.

Artillery positions, command posts, positions for reserves, landing fields, ammunitions dumps, garages, as well as the strongpoints for the protection of rear installations and communications, are found in the depth. Command posts are located within a group of shelters and trenches adapted for defense.

A widely developed network of roads facilitates the maneuvering of reserves, equipment, and matériel. The roads are usually extended to the rear of company areas, and, in places, up to the forward edge.

### General Conclusions

The Germans pay much attention to the use of terrain features in defense. By strengthening these features by engineering installations and other means, they attempt to save part of their forces for the creation of reserves. The terrain in front of the forward edge of the defense, as a rule, is well observed and covered by fire. The defensive positions pass along terrain features suitable for defense, and in many cases have some sort of natural obstacles in front of them.

The German defense is characterized by a carefully organized fire plan, which is based, as a rule, on the relief of the terrain. The greatest concentration of fires is planned for the forward edge. For this purpose, separate artillery guns and antitank guns are emplaced along the forward edge, and roving guns are also frequently used here.

Extensive artificial obstacles are covered by strong flanking and cross fires. Antipersonnel and antitank obstacles such as ditches, escarpment, etc., are seldom used. More frequently encountered are antitank and antipersonnel mines. Barbed-wire obstacles are usually set up in front of the forward edge in one or two and seldom in three rows. Wire obstacles are often reinforced by booby traps and equipped with various sound-making devices. Antitank minefields are laid in areas threatened by tanks and are located from 200 to 500 meters from the forward edge. As a rule, there is no definite system in the arrangement of mines. The density of obstacles along the front varies considerably.

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## Countering German Reconnaissance

Translated and digested at the Command and General Staff School from a Russian article by Guards Major G. Kosarev, Soviet Army, in *Krasnaya Zvezda* 6 October 1943.

THE German command does not send its spies through the front line any longer but leaves them in our rear when retreating. Usually, such spies stay in woods near roads, in trees, or in wheat stacks, and report by radio to their own forces the movements of supplies, personnel, and matériel towards the front. When the front line moves westward, they follow it.

To stop these activities, our advancing troops organize special detachments to clear the occupied territory, i.e., to comb the woods and groves and to inspect the ravines, and especially all areas in the proximity of main roads. Experience has demonstrated that it is best to get these detachments from second echelons. Engineers and local populace can also be used for this work.

Such detachments are not used against spies only. They also clean up the territory of remaining groups of dispersed enemy soldiers.

Our troops have learned fairly well the methods of reconnaissance which the Germans use when they advance. Now, under the conditions of the German retreat, many new methods are appearing. German tank reconnaissance is entirely different now. Here is one of the more frequently used methods.

Near the village of Skovorodino the Germans suddenly opened fire on a hill on our left flank with long-range guns and mortars.

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At the same time it was noticed that fifteen German tanks were moving along the front line toward our right flank. This was a feint. The German tankmen did have concealed approaches, but they purposely came out in the open and, forming a single column, moved slowly along the front line. This demonstration lasted from thirty to forty minutes. Then the tanks disappeared, but suddenly appeared again, and not on the same spot but in front of the hill which was being shelled. A "Tiger" was moving in the lead, and behind it, two medium tanks. Upon reaching the hill at high speed, they attempted to come very close to our combat formations, but having encountered artillery fire, turned back. One of them hid behind a haystack and remained there for observation, but the other two retired.

In recent battles this method was repeated quite often, and whenever the Germans employed tanks for reconnaissance they operated along this pattern. They shell the object of reconnaissance and feint a movement of tanks in the opposite direction, sometimes repeating this two or three times in order to create the impression of the movement of large forces. Later on, using gullies and other concealed routes, the tanks approach the object of reconnaissance and rush forward at great speed. If the attack is unsuccessful, one or two tanks take cover and continue reconnaissance by observation.

The mining of approaches is the best way of preventing such reconnaissance. As soon as it is known that the Germans intend to conduct reconnaissance with tanks in a certain sector, its approaches should be mined. Such an experiment was carried out once, and the results obtained were satisfactory. Out of the five enemy tanks engaged in reconnaissance, two were blown up by mines. Artillery ambushes are also justified, especially small ones: one antitank gun, two antitank rifles, and about five tommy gunners. In this case, it is important to determine the direction of movement of tanks and to place the gun so that it will hit the sides but not the front of the tanks.

In addition to tank reconnaissance, the Germans employ reconnaissance by fire, preparing it quite carefully. They move up a gun or a mortar to their advance positions and open a continuous fire at night. If our artillerymen, seeing clearly the target in front of them by flashes, open fire, then the Germans, in their turn, locate our flashes and plot on the map the disposition of our guns.

The method of reconnaissance by fire is simple and its prevention is not difficult. It is simply necessary to use only a few guns in each sector to answer this provocative shelling, and definitely to prohibit firing by all other artillery. If, contrary to expectations, the latter occurs, it is necessary to change all firing positions at once.

Formerly, the Germans preferred daylight operations, but now they begin to work at night, confining their night operations chiefly to reconnaissance. On our sector of the front the Germans open fire before nightfall, using incendiary shells and igniting in front of their advance positions everything that can burn—villages, stacks, straw, etc. If the artillery fire does not produce any results, soldiers are sent out to set fires. There were instances when stacks of wheat or straw were set aflame near the advance positions of our troops. This was done primarily to illuminate the disposition of our troops in order to observe them. As a rule, the Germans ignite the stacks not from below but from the top: this enables the stack to burn longer and emit strong, even light which lasts almost through the night. Against the background of this light, each silhouette is seen from afar.

Taking advantage of darkness, the Germans often attempt to get around our flanks in small groups, make their way in along the regimental or battalion boundaries, and seize prisoners. Recently, for instance, the Germans penetrated the edge of the grove which was located on the boundary between two of our units. There they climbed the trees and opened fire. The battalion commander in whose sector this happened figured out that there were three tommy gunners firing from the trees. He detailed a small group of men to liquidate these "birds." Before they had reached the grove, they encountered an ambush and a

fight started. Thanks to our timely measures the German ambush was destroyed. But it could have been worse, because the Germans had the following plan: to attract a small group of our men by firing from the trees, then to ambush them on the way and take them prisoners.

In order to prevent sorties of hostile scouts it is best to establish reconnaissance ambushes on the flanks or near limiting points. First of all, this will protect the flanks, and secondly, the ambush will often yield valuable information from captured prisoners.

Much more dangerous are German scout-signalmen. Single or paired scouts penetrate our combat formations or rear areas and, by firing multi-colored rockets, transmit to their troops the necessary information. Such signals in many cases remain unnoticed, because our fighters use captured German rocket flares, and often it is difficult to tell whether they are ours or the enemy's.

For instance, in the battle for a certain forest the following incident took place. Our artillery changed its firing positions and even before firing a single shot was suddenly subjected to strong artillery fire. The artillery displaced again, but even before the new position was occupied they were again shelled. One of the commanders called attention to the rockets which were being released nearby. A squad of scouts sent there to investigate seized two Germans sitting in tree-tops and signaling with rockets.

It is not difficult to prevent this. It is only necessary to establish definitely a certain combination of colors of the rocket flares released by our own troops and categorically prohibit their release when unnecessary. When everyone learns the color signals, it will not be difficult to recognize enemy signaling.

Certain peculiarities of the German reconnaissance methods which have appeared recently should be carefully studied, not only by our scouts but by all officers. This will enable them to recognize enemy tricks and to develop effective methods to counteract them. It should be remembered that by frustrating German reconnaissance we force the enemy to operate blindly and depend on guess-work.

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## Incendiary Weapons of Aerial Warfare

Translated at the Command and General Staff School from a German article in *Pester Lloyd Morgenblatt*, Budapest, Hungary, 10 March 1944.

THE most devastating weapon of aerial warfare is fire. Explosive bombs do their work in a matter of a few seconds, and although they are able to bring about great destruction, the effect of the explosion never spreads. The effect of incendiary bombs is exactly the reverse. After the impact, there is started an inconsequential fire which, in case it is not promptly taken care of, soon spreads to a point where it can no longer be extinguished. A single incendiary bomb of only a few kilograms' weight is able to destroy entire rows of houses if it is permitted to act unhindered. This fact has led to the employment mainly of incendiary weapons in air attacks. In the so-called terror attacks, incendiary bombs by the hundreds of thousands are dropped. The degree of effectiveness of incendiary bombs has been considerably increased during the last year. There is but a single defense against incendiary bombs: to nip the resulting fire in the bud. This requires, however, practice and presence of mind on the part of the population. In the following lines, the commonest forms of incendiary bombs are briefly described.

The most commonly employed incendiary bomb is the so-called "incendiary-rod." It resembles a lead pencil fifty-five centimeters long. The tip is of steel, the body itself is of magnesium alloy, and the charge is of the incendiary substance, thermite. The bomb burns with an extremely hot flame and radiates a blindingly white light. The burning

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portions that are thrown off set everything on fire within a radius of from two to three meters. However, these bombs only burn from four to five minutes, but the remaining slag often has a temperature of 1,000 degrees [centigrade] and is, therefore, dangerous for some time. These rods weigh only one and seven-tenths kilograms and are dropped in bundles of 180. For this reason we see that this incendiary weapon is seldom found in one place only.

This bomb has a time fuze. As soon as the fuze begins to function, two pale red flames appear on the bomb. As long as only the time fuze is burning, the bomb can be safely thrown out the window into the open. For five or six seconds after it lands, therefore, the bomb can be safely picked up in one's hand. In order to prevent this, the Anglo-Saxons provide from fifteen to twenty percent of the bombs with an explosive charge. The effect is similar to that of a hand grenade. Since one can never tell which bombs are provided with the explosive charge, one may stay away from the burning bombs till they have burned completely out. It is inadvisable to approach them without good cover.

In the present war, phosphorus and other chemical substances are mainly employed. Phosphorus bombs are much less employed but their effects are much greater. Several types of phosphorus bombs are used. The most dangerous are the real phosphorus incendiary bombs which are not unlike an explosive bomb. In the tip is a charge of gun powder; in the body of the bomb, an inflammable liquid (benzine or benzol mixed with crude rubber and phosphorus). As soon as the phosphorus comes in contact with the air, it ignites, and with it the inflammable liquid. This blazing mixture sticks to everything and soon flames are rising. If this liquid is extinguished with water, it again starts burning as soon as the water has evaporated. Various sizes and types of these phosphorus incendiary bombs are employed. "Incendiary boxes" are often dropped from planes. These resemble square-cornered gasoline cans. Their effects are similar to those of the incendiary bombs. The so-called incendiary bottles are mainly carried to their destination by means of air balloons. They resemble our beer bottles. Their effects are similar to those of the other phosphorus bombs.

The Soviets make use of thermite incendiary bombs of from one to two kilograms weight. So far, these have not been accompanied with an explosive charge and one may cautiously approach them. In addition to this the Soviets use 100-kilogram explosive bombs in which, in addition to the explosive charge, ten incendiary bombs are also included. The liquid-filled incendiary bombs of the Soviets are not charged with a phosphorus solution but with a mixture of naphtha and gasoline. They are manufactured in various sizes. After impact the thermite burns first and then ignites the inflammable liquid.

Lastly, we call attention to the fact that there has been much talk of incendiary bombs charged with a mixture of carbonic and sulphuric acids which were allegedly used in attacks on Berlin and Hamburg. These incendiary bombs were said to have set fire to whole blocks of houses and even to have set fire to the asphalt in the street. But these are exaggerations. Up to the present time there are no incendiary bombs which differ essentially from those we have described.

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**It is true that an officer may, to absolve himself if questioned on this subject, reply that he did it according to the Military Regulations. But that shall not vindicate him even if it is written in the Regulations, for here only rules are recorded—not times and situations, and for these he should have consideration.**

—Tzar Peter the Great (1672-1725) in a supplementary paragraph to the Russian Military Regulations.

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